ELECTRICAL REVIEW

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20th February, 1948

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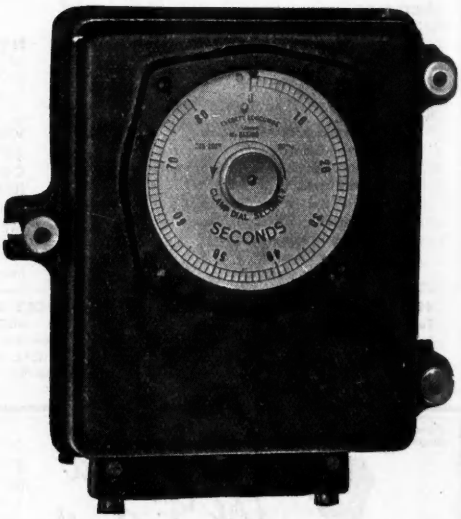

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXLII. No. 3665 20th FEBRUARY, 1948 9d. WEEKLY

Co-ordination in the Air

What are the Government's Intentions?

WHEN the Ministry of Fuel and Power was established in 1942 it was announced that one of its principal aims was to " co-ordinate " the fuel and power industries, an announcement which the electricity supply industry received with some apprehension. For some years the industry had been making remarkable progress and a great deal of it had inevitably been at the expense of the raw coal and gas industries. At first the coal industry itself was not perturbed because, after all, electricity undertakings were customers. There were, however, powerful coal-burning appliance interests which were very much concerned.

Gas Industry's Fears

But it was the gas industry which viewed electrical progress with the greatest alarm and worked hard to show that electricity was thermally inefficient and consequently a waster of a fuel which was getting rapidly scarcer. A large section of the public, being unscientific, cared nothing for thermal efficiency, as it was satisfied that electricity was more convenient and cleaner than gas for many domestic purposes and indispensable for a few of them. To say this is not to accept the gas industry's contentions with regard to efficiency or to ignore the powerful fact that much of the coal used in generating stations is useless for gasification.

The electrical industry fears that attempts are likely to be made to allocate " spheres of influence " to gas and electricity in spite of public preferences. For instance, it might be decreed that gas must be used for space heating. At the present time there are good reasons for discouraging the use of electric fires, which overburden the system during peak periods. But these reasons are not applicable to other forms of electric heating which are apt to be ignored by co-ordinators. Water-heating, too, might be considered a gas matter and strong efforts might be made to ensure that a substantial part of the cooking load remained with gas.

The nationalization of coal and electricity supply and the coming taking-over of the gas industry have brought this subject into greater prominence: the way for co-ordination has been made much simpler.

In moving the second reading of the Gas Bill, Mr. Gaitskell, Minister of Fuel and Power, suggested that in its " present antiquated form " the gas industry could not compete effectively with electricity. But if it had been intended that competition between gas and electricity should disappear, why should not the Government have set up boards to run both gas and electricity ? Competition " restricted in certain ways " would continue.

Consumers' Choice

Later he referred to the possibility of joint planning, saying that there should be effective co-ordination of the field of fuel and power as a whole. " Co-ordination " was defined as the satisfaction of the consumers' needs at the minimum cost to the community. This end would be achieved by " arranging the relations between the fuel and power industries, the

scale of their activities and the purposes they serve so as to get the best results."

It thus appeared that what the Minister had principally in mind was co-ordination at the generating or production end. When dealing with consumers' preferences he agreed that the general principle of freedom of choice must be upheld and said that the value of retaining competition between gas and electricity must not be overlooked. But then he proceeded to mention "safeguards" and particularly referred to the framing of tariffs "to reflect the true cost of production and distribution to the community." Thus the consumers' choice would be "influenced by reference to costs."

Although Mr. Gaitskell was somewhat equivocal it looks as though he had discriminatory charges in mind. The course of events will have to be carefully watched if electrical development is not to be curbed for the benefit of an antiquated gas industry.

Rebates and Charges

STEPS were taken in the Electricity Act, 1947, to prevent company electricity supply undertakings from "dissipating" their assets but there were no corresponding provisions relating to local authority undertakings. This has been remedied, rather belatedly, by the issue of an Order prohibiting these authorities from giving rebates to consumers—a practice that many have been following recently. It may be contended that consumers have only been getting back what they have been overcharged. The Order is accompanied by another which prevents undertakings from reducing charges, save under licence. As a general rise in the price of electricity now seems to be taken for granted it may seem superfluous to prohibit undertakings from reducing charges, but the measure is obviously necessary to supplement the other Order. But not all loopholes are stopped up: it still seems to be possible for funds to be diverted to rate relief, within the existing limits—which is strange.

Over Forty-Five

ONLY a small proportion of those on the Register of the Professional Engineers' Appointments Bureau last year (as reported on page 273) were actually out of work. Most of these were more than forty-five years old. With their powers still unimpaired and their experience matured they should be well worth the higher salaries required for meeting their usually greater responsibilities. Expectation of working life is, however, shorter, and the electrical industry has reached a stage at which many senior engineers are near to retirement. Continuity of policy is therefore more difficult to establish, and provision for superannuation becomes progressively more expensive to all parties. While employers' contributions are a justified reward for long service, the circumstances referred to by "No Pension" in our issue of 6th February should also be taken into account.

Closed-Cycle Gas Turbine

THE 15,000-kW gas-turbine set which Mr. P. Philip, borough electrical engineer, Dundee, proposes to install at Port Carolina power station differs from the unit ordered for the Trafford station of the Stretford Board (*Electrical Review*, 7th December, 1947) in an important respect. It is to be of the closed-cycle type, which is expected to result in a thermal efficiency appreciably higher than that of a comparable steam plant; also the design could be adapted to pulverized-coal combustion. Like the Trafford set, however, its main duty, in view of the high cost of bunker oil, will be to cope with peaks. It will also be available to cover any seasonal water deficiencies at the Pitlochry station.

The Proving House

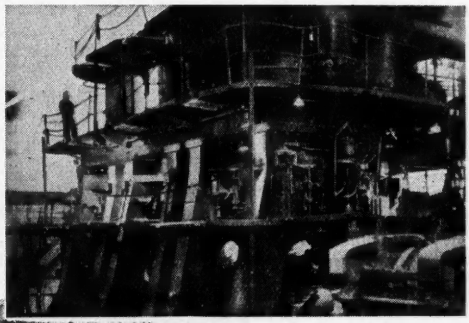
MANY would prefer the E.D.A. testing house which has now been set up to be charged with the positive duty of marking as safe to use all smaller electrical appliances instead of only registering disapproval of offending apparatus. That procedure would, however, have entailed delays too lengthy to meet present needs. Inferior imported appliances are not now the potential danger they were before the war, but there are those in this country who have only recently started to manufacture electrical appliances and are without the experience of what to avoid that is possessed by long-established concerns. These will no doubt find it advisable to seek expert advice from the E.D.A.-B.S.I. Joint Committee as to whether their designs are likely to infringe safety requirements, thus avoiding the possibility of later censure.

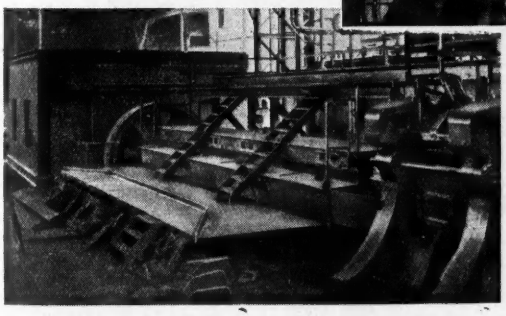
Rolling Mill Conversion

Advantages Resulting from Electrification

A SAVING of 100,000 tons of coal a year, greater efficiency and simplicity of operation, lower costs and more economical manufacture of steel, increased output, and the ability to manufacture new products previously impossible. These are a few of the advantages resulting from the recent conversion from steam to electrical operation of the drives of the associated works of the South Durham Steel & Iron Co. at Cargo Fleet and the West Hartlepool Rolling Mills.

Several considerations combined to influence the owners of the plant to carry out the change-over. In the first place it was realized during the war that there would be a substantial increase in the fuel costs in the manufacture of iron and steel and any post-war development could only be economically sound if power costs were reduced to an absolute minimum. Then there was the anticipated development of export trade. Reconstruction programmes too would require wider plates to meet the ever-increasing demand of welded fabrication development, and broad flange beams for the more economical use of steel and lower fabrication costs would also be needed.





Above: Original 16,000 h.p. of the roughing mill at Cargo Fleet as it appeared on Saturday, 18th January, 1946
Left: Completed electric drive with motor house as the mill went into operation on Thursday, 23rd January, 1946, for trial run

From the operating point of view it took about 2¼ cwt (114 kg) of fuel per ton of steel rolled using the steam engine drive: the equivalent consumption employing electricity is only ½ cwt (25 kg), representing a saving of 1¾ cwt) (89 kg) for every ton of steel rolled. The steam engines also suffered from the serious disadvantage that they had to be started up 8 hours before they were required, representing a considerable loss in production due to fuel and steam delays amounting to over 500 hours a year: the electric drive can be brought up to maximum speed in just over 5 minutes and can be stopped in 2½ minutes. This has meant a considerable stepping-up of rolling rates. Furthermore the steam engine is inclined to cause the rolls to "snatch" at the bar with a possibility of buckling it or even breaking the rolls: the electric drive on the other hand both takes the bar and accelerates smoothly.

The 32-in. (81 cm) section rolling mills at Cargo Fleet, which are claimed to be the only mills in the country with four stands of this size, are capable of rolling the widest range of structural sections. With the change-over to electric drive provision was made to utilize the increased torque available for the rolling of many sections of broad flange beams with parallel flanges, in addition to the existing range of production. Up to that time Great Britain had never been able to produce broad flange beams, the world's market being supplied by either the Continental makers or the United States.

The method in which the change-over to electric drives was accomplished was remark-

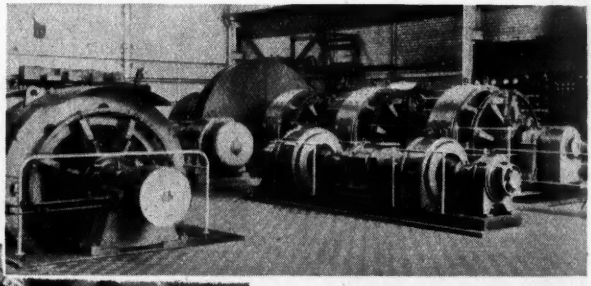
able for the absolute minimum of interference caused to normal production. Actually four main drives were converted from steam to electric drive within twelve months in the section and plate mills without any stoppage of production whatsoever. The first drive converted was that of the roughing mill of the 32-in. section at Cargo Fleet. As the first stage the electric motor was installed at the extreme end of the steam engine. Then at the end of the Saturday morning shift at 1 p.m. on 18th January, 1946, twenty men armed with oxy-acetylene cutters set about the demolition of the massive 16,000-h.p. steam engine.

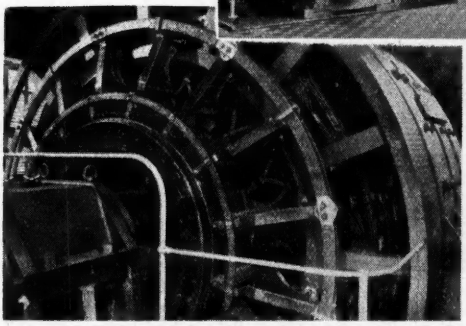
By 8 a.m. Monday 600 tons of metal had been removed and the crankshaft taken out. A coupling shaft was then mounted in place of the crankshaft, using the engine bedplate to house the driving shaft, and by Thursday, only five days after the start of the work, the mill was given a trial run with the completed electric drive, normal production being in progress the following day.

With this drive working it was possible for the complete mill train, comprising four stands, to be operated satisfactorily and for the change-over to be made of the finishing mill drive without any serious interference to the production, normal throughputs being maintained.

The electrical equipment of the roughing drive supplied by the British Thomson-Houston Co., Ltd., comprises a reversing d.c. motor supplied from a flywheel motor-generator set. The reversing motor has a nominal rating of 4,850 h.p., 54/140 r.p.m., 625 V and has a cutout h.p. of 14,500 corresponding to 195 metre-tons at 54 r.p.m. A fabricated construction has been adopted and the armature legs have been bunched together to facilitate cleaning. The motor-generator set consists of a slip-ring induction motor, rated at 3,000 h.p., 750 r.p.m., 11,000 V, which drives three 1,300-kW, 625-V generators and a flywheel having stored energy of 150,000 h.p.-sec. The generators operate in parallel to supply the reversing motor.

The induction motor is controlled by an automatic liquid slip regulator for limiting the line peaks, and for stopping the set quickly d.c. dynamic breaking is supplied to the induction motor. For the control of the reversing motor the Ward-Leonard system is used. The B.T.H. main controller which is mounted in a control desk in the mill driver's pulpit controls the fields and exciters for the mill motor and generator. The extremely rapid acceleration and retardation of the mill motor is obtained by the use of "field forcing," and automatic limitation of the d.c. currents, under all conditions, is obtained by means of "Amplidynes." The control of the speed of the mill motor from zero to ± 54 r.p.m. is by generator voltage. Above this, i.e., from 54 to 140 r.p.m. control is by variation of the mill motor field. This control enables the mill driver to obtain the maximum production of which the mill and drive are capable. The space vacated by the steam engine is now being put to good use for roll changing equipment.

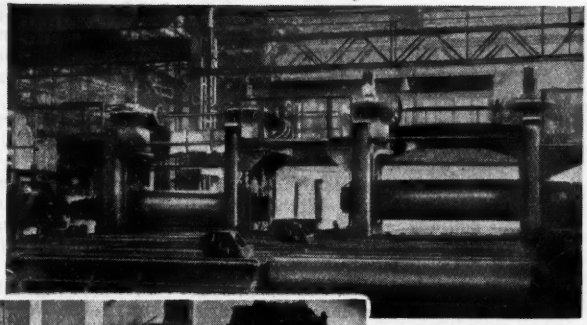


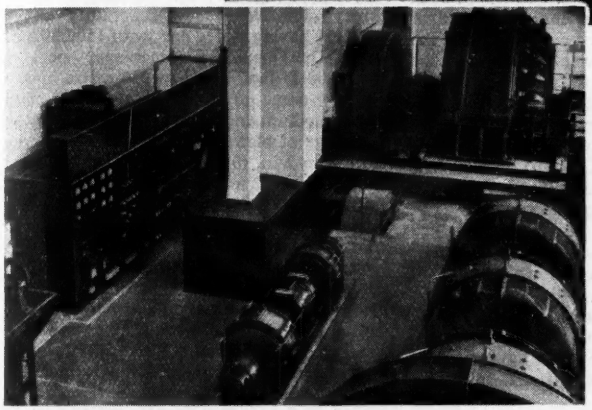


Above: Main roughing mill motor drive as installed

Left: Main mill motor for the finishing drive at Cargo Fleet

With the roughing mill drive capable of running all four stands a speedy conversion of the finishing drive was not of such urgency. It was, however, completed in just over ten weeks and was put into commission on 21st September, 1946. The electrical equipment of this drive was

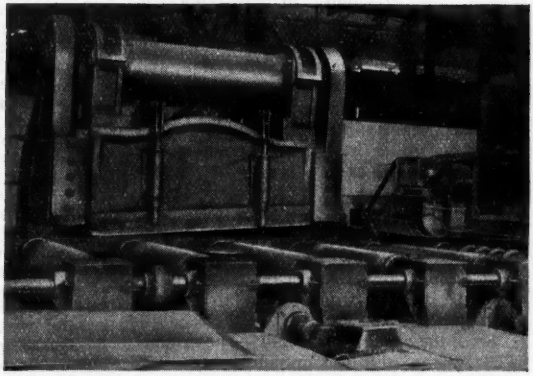




Above : Hard and soft roll stands at West Hartlepool
Left : General view of the mill motor-generator set at West Hartlepool

supplied by the Metropolitan-Vickers Electrical Co., and comprises a reversing d.c. motor supplied from a flywheel motor-generator set. Ward-Leonard control is employed. The reversing motor has a nominal rating of 4,850 h.p., 54/140 r.p.m., 675 V. The motor-generator set consists of a rated 3,000-h.p., 740-r.p.m., 11,000-V induction motor, three 1,300-kW, 675-V generators and a cast-steel flywheel 12ft (3.6 m) in diameter, weighing 17 tons and having stored energy of 150,000 h.p.-sec.

These electric drives give the mill a much wider range, particularly for broad flange beam production and other sections which demand heavy draughting. The risk is also eliminated of steam stoppages and high fuel wastage in the event of blast furnace and coke oven gas supplies being reduced, as sometimes occurs in an integrated iron and steel works. Greater rolling rates are being obtained and the mill is very versatile, being capable of producing between 5/6,000 tons of larger structural sections and broad flange beams per week. One further advantage of the electric drive is that all four stands can now be driven from the finishing end as well as



Electrically operated side shears with magnet manipulators

the roughing end: previously only three could be so driven. The average power consumption of the mill for the first twelve months operation was 41 kWh per ton.

As a further extension of the electrification a 40-in. (102 cm) cogging or blooming mill is to be converted at the earliest opportunity.

In the similar conversion scheme covering the plate mills at the West Hartlepool works, the programme commenced with the slabbing mill. This mill was taken off production on Saturday, 9th February, 1946, and was rolling slabs with the electrified drive in the early hours of the following Monday, 11th February. The electrical equipment had of course been previously installed ready for the change-over. This conversion enabled the rolling capacity of slabs to be increased from 4,000 tons to 7,000-8,000 tons per week. The average power consumption in this case is 13 kWh per ton, rolling from 7½-ton ingot down to a slab of 3 in. (7·6 cm) thick.

The electrical equipment of this drive was supplied by the English Electric Co., and comprises a reversing d.c. motor supplied from a flywheel motor-generator set. The reversing motor has a nominal rating of 4,000 h.p., 43/90 r.p.m. 840 V. The motor generator set consists of a 3,000-h.p., 667-r.p.m. 11,000-V induction motor, two 1,615 kW generators and a flywheel having stored energy of 150,000 h.p.-sec.

Smooth Speed Control

Servo motor control and Lockheed transmission are provided with the main controller situated in the motor room and not on the driver's platform. The control lever can be moved from one extreme position to the other very rapidly with the minimum of effort and without the possibility of damaging the electrical equipment in any way. The rates of acceleration and deceleration are independently adjustable by the supervisory staff, and enable the maximum output to be obtained from the mill consistent with the capabilities of the electrical equipment. A special feature of this controller is that any erratic movements of the driver's control lever are not transmitted to the main controller as the servo gear ensures a steady drive thus giving smooth acceleration and deceleration to the mill.

The conversion of the heavy plate mill at West Hartlepool from steam to electric drive eventually became part of the rehabilitation of the existing plate mill. The original steam driven mill was mounted with 9 ft (2·7 m) length barrels and was not capable of meeting the demand for wider plates, the average output being in the region of 1,700 tons of finished plates per week. With the new electric drive 12-ft (3·6 m) barrels are driven and the capacity of the mill has been increased to 3,000 tons of finished plates per week.

The Metrovick equipment employed here comprises a reversing motor supplied from a flywheel motor-generator set. The reversing motor has a nominal rating of 5,000 h.p., 54/140 r.p.m., 675 V. The motor-generator set consists of an 11,000-V induction motor, three 1,300-kW, 675-V generators and a flywheel having stored energy of 150,000 h.p.-sec. The maximum emergency peak is 1,416,000 lb feet, equal to 230 metre-tons.

The average power consumption for plates (light, medium and heavy) is 63 kWh per ton, the range of plates rolled in the mill varying from ⅜ to 2 in. (0·95 to 5·1 cm) thick, maximum width 132 in. (335 cm) finished sheared. Each mill driving motor is fitted with a Wellman Bibby flexible coupling capable of transmitting a torque of 230 metre-tons; the resilience of these couplings permits a high reversal rate with a minimum of shocks to the electrical equipment of mill driving spindles, pinions and rolls. All machines are force ventilated from 20-bank Visco oil filter units.

We thank those members of companies' staff, in particular Mr. G. Barry Thomas, the general works manager at Cargo Fleet, Mr. T. J. Williams, general works manager at West Hartlepool, and Mr. A. Taylor, chief engineer, for their assistance in the preparation of this article.

E.A.W. Activities

THE subject of "Transmission and Distribution of Electricity" has been tackled anew by the Association in a chart to replace the original No. 2 in the "Electricity Made Easy" series. The new chart is in four colours, and measures 30 in. by 40 in, depicting electricity in its course from the power station to four main types of consumer—a farm, a factory, a village, and a town. This new chart links charts Nos. 1 and 3, the former showing generation of electricity, and the latter showing the circuits in the home (each 6s. 6d., post free).

At the nineteenth E.A.W. Certificate examination in electrical housecraft for teachers thirty-one candidates qualified for the certificate. The total number of certificate holders is now 1,302. Sixty-five qualified at the twenty-second E.A.W. Certificate examination in electrical housecraft for demonstrators and saleswomen, the total number of holders being now 1,246.

Views on the News

Reflections on Current Topics

A CORRESPONDENT complains that when he went to the showroom of his supply authority to purchase a portable electric fire an assistant told him that they were not allowed to sell electric fires. He is naturally annoyed but unfortunately there is something to say for the supply authority's attitude. The electric fire is alleged with a certain amount of truth to have been largely responsible for the exaggerated peaks in the winter load curve which have been a source of great anxiety to electricity suppliers. Can it be wondered at that these authorities look askance at the connection of further fires to their mains ?

* * *

I have just been shown a circular sent to the Press by a well-known *British* electrical development association. This describes at some length an infra-red drying installation employed by an American concern. The probability is that some of the lay newspapers will boost it as a wonderful new development, whereas, as my readers are fully aware, we have done a good deal of infra-red work in this country. Why was it necessary then to publicize the United States electrical industry ? Too often I see in the daily papers stuff of this kind, implying that British manufacturers are behind their American counterparts. This is not helping our export trade.

* * *

The popularity of the electric steaming iron has induced an American manufacturer to bring out a steaming attachment for use with a standard type of iron. This may be the answer to those who dislike the idea of the proximity of water to electrical wiring on the score of possible danger.

* * *

Increasing prices and scarcity of coal have turned attention to peat as a possible supplementary fuel. Meagre encouragement is given to hopes of this kind, however, in the recent report of the Fuel Research Board. Although the use of peat for steam raising should present no insuperable engineering difficulties, the heavy seasonal labour costs of preparation, including the reduction of moisture to manageable proportions, would give it little economic advantage, if any, over coal at the pithead. In addition there is the high cost of transport per therm of a very bulky fuel of relatively low calorific value to sites suitable for the generation of electricity. It has always seemed to me that peat is more appropriate for the domestic hearth than the power station and the report confirms this.

* * *

Much is being made of the acquisition of the Prince's Hotel, Hove, by the South Eastern Electricity Board, the first of its kind. I think the Board is to be congratulated on choosing a very delectable spot for its headquarters; although it is not very central it is no doubt easily accessible from most parts of the area. Most of the Area Boards will be compelled to find what will be regarded as palatial premises to house their necessarily large staffs. Few of the offices of the constituent undertakings will be big enough for this and so we may be prepared for further charges of extravagant expenditure. It is probable, however, that the money spent on these premises will be less than the total cost of existing local offices in an area, which may number fifty or more.

* * *

An idea of the kind of difficulties manufacturers are having to overcome in these days of material shortages was given to me a few days ago when I visited a firm of switchgear manufacturers. Faced with a shortage of chain used for the compression of circuit-breaker springs, the company, rather than hold up production, has asked its employees to buy what bicycle chains they can. For these the cost plus a small addition for their trouble is paid. It is wrong that manufacturers should have to employ such devices as this. Surely the Ministry of Supply could arrange to make available to them the comparatively small quantity of chain required.

* * *

I hear that a demonstration was recently given in Philadelphia of the " microtome," a knife for cutting super-thin rashers. It is said that the blade is electrically driven at 60,000 r.p.m. and that it shaves off slivers of bacon so fine that they can only be detected under the electron microscope. Mr. Strachey has no doubt already made note of this new invention.—**REFLECTOR.**

Electrical Research Association

Speeches at Annual Luncheon

THE twenty-seventh annual general meeting of the British Electrical and Allied Industries Research Association took place in London last week, being entirely formal.

Presenting the annual report (*Electrical Review*, 6th February, p. 202) and accounts, which were adopted without comment, MR. ROBERT LEE, the retiring chairman of the Council (I.M.E.A. representative) said that at last year's meeting they had expected to receive a Government grant, amounting to ten shillings for every £1 collected, in aid of the fund it was intended to raise for the building of new laboratories at Leatherhead. The appeal for donations had had to be postponed, pending the outcome of consultations with the British Electricity Authority; this was the last year in which electricity supply undertakings and municipalities could contribute to the E.R.A. funds.

Mr. Lee paid tribute to the manufacturers for supporting the funds and, personally, hoped they would continue to co-operate. It was necessary to consider means of increasing income, if the E.R.A. was to continue to do the work it wished to do. All possible steps would be taken to ensure the Association's continuance.

The new chairman of the Council is Mr. J. R. Cowie (manufacturers' representative) who is chairman of the Finance Committee and has been a member of the Council for twenty-seven years, longer than any other member.

Lord Citrine on the Future

The EARL OF MOUNT EDGCUMBE (president) occupied the chair at the subsequent buffet luncheon, which was well attended. LORD CITRINE (chairman, B.E.A.) was the principal speaker. He said that he was unable to say what conception the B.E.A. would have of research, or what its own activities were likely to be in that sphere. It had had to rely on the services of men who were already fully occupied, so there had been only a "few fleeting moments" in which to consider policy. The B.E.A. not only welcomed research, but would do its utmost to further systematic research and guide it to specific purposes.

Their policy was interim in character; it was to avoid irrevocable commitments, to avoid dislocation and disturbance of persons and things. However revolutionary the new order might seem, the change was really evolutionary; they must try to continue those processes which were helpful and beneficial to the industry. The duty of the B.E.A. to conduct research itself had been more precisely defined than in the cases of the other nationalized industries, but consideration was too immature to permit of any pronouncement being made now and, moreover, the Minister must first be consulted.

It should not be overlooked that, in addition to the B.E.A. having power to conduct research itself, it had also been given power to assist others to prosecute research and Lord Citrine promised loyally to help in this. Provision had already been made of an interim character. There was no desire to be obstructive; proper consideration of capital programmes was nothing more than ordinary business caution.

That was probably the last occasion on which the E.R.A. would meet in its present form and he paid tribute to those who had left that legacy and for those who were willing "to put their backs into it" there were most promising prospects.

The EARL OF MOUNT EDGCUMBE remarked that they had all hoped to learn what their future was to be, but they must now "wait and see." He felt that it would be a disaster if the E.R.A. were to be dissolved, or if any one of the partners were to be considered more important than the others; the present make-up had proved to be the best.

Now that research had come to be spelled with a very large "R" there seemed to him to be some danger of its becoming too fashionable. Small manufacturing concerns might be encouraged to experiment on their own account instead of first referring their ideas to the E.R.A, which could tell them right away whether they were worth pursuing. Lord Mount Edgcumbe hoped for more co-operation between different research associations; they would gain by consulting each other's reports on subjects of common interest.

MR. J. R. COWIE proposed "The President" and afterwards presided at an afternoon meeting of the Council.

I.E.E. Glasgow Dinner

PROPOSING the toast of "The Institution of Electrical Engineers," at the annual dinner of the Glasgow Centre on 11th February, Dr. James McNeill, of John Brown & Co., Ltd. (president of the Institute of Engineers and Shipbuilders in Scotland) claimed that the electrical installations in British ships were incomparably better than those of our chief Continental competitors. Mr. H. M. Speirs, chairman of the Centre, presided. Acknowledging the toast of "The City of Glasgow," proposed by Mr. James Gogan, vice-chairman of the Centre, Councillor John Davis said that when almost every local authority in the area could incorporate in its housing plans the preparation of all-electric schemes, it seemed to him rather tragic that Glasgow's post-war housing plans had not reached that standard of progressiveness.

Science and Industry

Highly-Organized Research

HOW science leads to progress in industry was the theme of an address by SIR EDWARD APPLETON (D.S.I.R.) to an audience of over 1,000 people at a meeting arranged by the Scottish Council (Development and Industry) at Glasgow last week.

Sir Edward said that both science and industry had developed in complexity, with the difference that whereas contact between them had formerly been fortuitous and spasmodic, depending very much on the interests and inclinations of individuals, nowadays the means of bringing science to bear upon industrial problems was highly organized. Industrial research had become a business of itself, making it necessary for those who intended to participate in it to have adequate knowledge of its general pattern and methods.

Sir Edward's belief was that the first task of any country that desired to develop science as an aid to industrial progress was to foster fundamental research in its universities and technical colleges, for it was there that really revolutionary industrial advances had their origins.

He then explained how the Department of Scientific and Industrial Research was discharging its task of encouraging science in industry. He indicated how the work of the thirteen national research establishments differed from that of the universities. He spoke about the things research associations, particularly those functioning co-operatively, were doing and the services they rendered to their members. Then he turned to what he described as perhaps the most important of all the agencies; the research departments of individual firms, which were the final link between research and production.

The ultimate decision on how far new ideas were to be applied in industry must obviously rest with industry itself and the manner in which they were to be applied must be settled by the management. Unfortunately there were no general solutions to those problems; so it was very important that the research department of a firm should have direct access to the management and that the latter should base its decisions on the evidence presented by the department. The industrial scene must be constantly in review and watch kept for opportunities to apply science.

Sir Edward finally referred to the employment by the Scottish Council of a whole-time scientific officer (Mr. W. F. Robertson, formerly of the D.S.I.R.) and to the availability of the Edinburgh office of the D.S.I.R. (under Dr. H. Buckley) to assist Scottish industry. Their main purpose was to effect contact between "the man who wants to know and the man who knows."

Professional Engineers' Appointments

Past Year's Work of the Bureau

IN a statement summarizing last year's work of the Professional Engineers' Appointments Bureau, the registrar and secretary (Mr. R. W. L. Harris) reports that the average number of registered names was 634—127 civil, 260 mechanical and 247 electrical engineers. The total was approximately two-thirds of that for 1946. The number of vacancies notified by employers was 1,048 and the income from appointment fees (£1,179 from 214 engineers) increased by 10 per cent.

The reduced number on the Register is partly due to fewer engineers being out of employment and to the decreasing rate of demobilization. The decrease applied to all age groups, but was slightly more for those under thirty-five. The average age of men on the Register increased from 34·4 to 35·6 and of those placed from 30·1 to 31·5.

Less than ten per cent of the engineers registered are out of employment, and most of these are over forty-five years of age. Obstacles have been requirements for work within travelling distance of a specified address, high salaries, occupation in a very specialized field or, in a very few instances, physical handicaps.

Appointments of engineers nominated by the Bureau were in a number of cases held in abeyance in view of the reductions in capital expenditure or unsuitable conditions. Offers made to engineers as the result of the Bureau's introductions greatly exceeded in number the actual acceptances, mainly owing to the housing situation not only in this country but also overseas. In the past two years the bureau has filled fifty posts overseas, but has had difficulty in finding candidates for posts in the Tropics, which represent a high proportion of overseas vacancies notified. Appreciation expressed by many members indicates the need that is fulfilled by the advisory service of the Appointments Bureau on a wide variety of subjects relating to employment.

The Bureau has been incorporated as a company limited by guarantee to avoid the possibility of infringement in the use of its name. Its scope covers members of the Institutions of Civil, Mechanical and Electrical Engineers and persons possessing qualifications for admission to one of those bodies.

NEW BOOKS

Television Exposition. Fluorescent Lighting Practice.

Television To-day. By Roy C. Norris. Pp. 255; figs 189; index. Rockliff Publishing Corporation, Ltd., 1, Dorset Buildings, Salisbury Square, London, E.C.4. Price 21s.

In spite of the fact that fair-minded television engineers in other countries acknowledge that Britain leads the world both in television engineering techniques and in the implementing of the promise of television as a public service, we are woefully short of good books on the subject. So this book, as the foreword points out, appears at the opportune moment when British television, having survived a most difficult first year after the war, is beginning to gather momentum.

Three classes of reader will find much interest and enjoyment in this book; they are the intelligent viewer with an inquiring mind, those engaged in the radio retail trade (particularly television service engineers) and students desiring an overall picture of development as it stands to-day, thereby enabling them to proceed with confidence to further study should they choose television as a career. The returned ex-serviceman with radar and signals experience will find this book the ideal means of putting him in the television " picture."

The author has attempted to explain in simple language all aspects of the complicated business. He has " boggled " at nothing and has succeeded in producing a popular exposition of the subject, excelling anything hitherto produced. The layout has been carefully worked out and the explanations flow on easily with satisfactory continuity.

I have found only a few mistakes in the printed matter and they are merely of a typographical character. Unfortunately one cannot say the same of the circuit diagrams. There are a number of draughtsman's errors; for instance, I do think that in Fig. 62 it is intended that the secondary of T.1 should be connected to the anode of V.2. And again, in Fig. 151 reference is made to a special bias circuit in (e) Fig. 125, whereas no such circuit is shown in (e), although it is similar to (b) Fig. 125. There are further confusions in the diagrams caused by the draughtsman's inability to make up his mind how to indicate when it is intended that two wires should be connected together, or merely pass over one another.—J.E.C.

Fluorescent Lighting Manual (2nd Edition). By C. L. Amick. Pp. 318; figs. 210. McGraw-Hill Publishing Co., Ltd., Aldwych House, Aldwych, London, W.C.2. Price 20s.

The fact that this American book has reached a second edition within five years is a testimony to its excellence, and the number of changes needed in that time is evidence of the rapid development of the subject with which it deals. Fluorescent lighting is the fashion even more in the United States than in this country, because of its comparatively unfettered progress there during the war. It is not surprising, then, that there should be a real demand for up-to-date information on everything that affects design, installation and maintenance. This information the author is well qualified to give and he has produced a full and reliable compendium covering not only hot-cathode, but also cold-cathode lamps and practice.

The least successful parts of the book are those in which the author deserts the light source as such for consideration of such matters as lighting economics, glare ratings, the relation between light and sight, etc., but these form only a small fraction of the whole book and the factual information it contains is alone sufficient to make it a very desirable addition to the library, not only of every lighting engineer, but of everyone in any way concerned with fluorescent lighting. The installation hints and service suggestions are especially valuable to the electrical engineer who has no specialized knowledge of this type of lamp. The section on radio interference deals with a matter about which little has been heard in this country so far, but which will inevitably become more important as the domestic use of fluorescent lamps increases.

For the reader in this country the book suffers from the defect which is so common in American publications, namely the absence of any reference to work published outside the United States. It is therefore perhaps not out of place to mention that the literature of the subject published in this country is by no means inconsiderable and has the advantage of dealing with the type of fluorescent lamp developed here.—J.W.T.W.

Books Received

Modern Rubber Chemistry (2nd Edition). By Harry Barron, Ph.D., B.Sc., F.R.I.C., F.I.R.I. Pp. 502; figs. 140; index. Hutchinson's Scientific & Technical Publications, 47, Princes Gate, London, S.W.7. Price 36s.

Electric Wiring (Domestic). Edited by E. Molloy. (3rd Edition). Pp. 240; figs. 244; index. George Newnes, Ltd., Tower House, Southampton Street, London, W.C.2. Price 7s. 6d.

Testing Electrical Installations and Machines. Edited by E. Molloy. (4th Edition). Pp. 203; figs. 118; index. George Newnes, Ltd. Price 7s. 6d.

Electro-Technology for National Certificate. By H. Teasdale and E. C. Walton. Pp. 325; figs. 193; index. English Universities Press, Ltd., St. Paul's House, Warwick Square, London, E.C.4. Price 9s. 6d.

CORRESPONDENCE

Letters should bear the writers' names and addresses, not necessarily for publication.
Responsibility cannot be accepted for correspondents' opinions.

A.C. Motors—Starting Currents

IN your issue of 6th February you reviewed a booklet detailing recommendations for starting conditions for a.c. motors on public supply mains, made by a Joint Committee which appears to have the blessing of both the Ministry of Supply and the Electricity Commission.

It is to be hoped that the British Electricity Authority will accept these recommendations in their entirety at an early date and that the Area Boards throughout the country will co-operate with trade interests in interpreting the recommendations in a commonsense and mutually helpful manner.

The only criticism I venture to offer is that the vexed question of starting conditions for single-phase motors, which has long been a most difficult matter in some areas, has not been dealt with. Many of the existing regulations imposed by supply authorities who have a single-phase network, are out of date, and, in some respects, are absurd, frequently resulting in the installation of unnecessarily costly equipment.

*London, N.*1. W. E. LAWTON,
Chairman,
Association of Electrical Machinery Traders.

THERE is much in the suggestion made in Mr. A. N. D. Kerr's letter in your issue of 6th February that should commend it to the Joint Committee; if adopted, it would ease many of the problems now associated with the choice of suitable starting equipment.

The general tendency is to consider the switch-on current of all squirrel-cage motors as being between three and four times full-load current, whereas for many now in service it is nearer six to eight times full load. This leads to trouble with overload settings, excessive burning of contacts where "inching" is necessary, and undue stresses on the transformer of an auto-transformer starter.

If the actual switch-on current were indicated on the motor name-plate by the suggested code letters, it would be of great service to all connected with the installation and use of s.c. motors and it is to be hoped that the idea will be included in the recommendations.

By the same token, it would also be of great assistance if, in the case of slip-ring motors, the rotor volts, amps and resistance per winding were marked on the name-plate, since knowledge of the starting current depends to a large extent on accurate figures for these items being available.

Sheffield, 7. J. E. PEGG.

Suggestions to Employers

AS one who uses your "Situations Vacant" columns I would like to suggest that it would be a great saving in time, money, and labour if advertisers using box numbers would at least state the locality of the job and the salary offered. It is hardly necessary to advertise a job two or three times in view of the number of men applying for appointments. It would also be advantageous if advertisers would reveal their names instead of using box numbers.

London. A.M.I.E.E.

Electrical Faults and Gas Ignition

RECENTLY I was called to the house of a client who reported that gas had ignited in a pipe in a cupboard containing the gas-meter. Fortunately he had the presence of mind to turn the gas off, and no damage was done.

During my investigations I found that the ignition of the gas had occurred simultaneously with the blowing of a fuse caused by a fault just above the connector of an electric iron which was being used at the time, and was connected to a three-pin 15-A switch-plug. In the cupboard I discovered that the fused gaspipe was leaning over against the water main with no electrical conduits or cables within a distance of 12 ft.

We called in a plumber and had the gas pipe repaired, taking care to see that it was kept as far away as possible from the water main. We then examined the installation, which I have no hesitation in saying is a first class one. The earth conductor bonding the screwed steel conduit system to the water main was found to be in perfect condition. As a test we inserted a fuse between the phase and earth of one of the 15-A switch-plugs and the fuse blew instantaneously.

We have just had a further call from the

same house to say that violent sparking had been seen at a gas wash-boiler in the kitchen. Investigation again proved that the sparking took place when a fuse was blown, due this time to a fault in the flexible of a small electric fire.

In order to prove that the report that we had received was correct, we again inserted a fuse between phase and earth, and on closing the switch there was a shower of sparks at both points where the water and gas pipes entered the gas boiler. These pipes are not rigidly clamped to the boiler, but enter through holes in the outer casing having a very small clearance. It would appear, therefore (and tests show) that in this particular instance the gas pipe is a much better earth than the water pipe.

Both our client and ourselves are very much worried about this state of affairs, and we would be very pleased to receive advice from any of your readers as to the best method of treating such a case and so getting rid of a potential danger to the house.

Galashiels. J. C. H. ALLIN.

Reducing Maximum Demand

THE shunting of capacitors across the line terminals of fractional horse-power motors, as described by "BCM/Kilovar" in the letter published in your 13th February issue, will have advantages additional to that of reducing kVA input, particularly in the case of repulsion induction motors. These advantages are reduction in starting current and increase in permissible output for the same temperature rise.

The latter point was well brought in an article "Repulsion Starting for Capacitor Motors" published in the A.I.E.E. Journal of October, 1931 (*Electrical Engineering*, Vol. 50, No. 10, pp. 830-1). In the case of the split-phase motor, however, these improvements will be more noticeable if the capacitor is permanently connected in series with the auxiliary phase instead of in parallel across both the starting and running windings.

*London, S.W.*1. A. N. D. KERR.

Peak-Load Control

NO doubt Mr. Daines speaks of his own experience with ripple control relays when he mentions a reliability of only 99 per cent. Taking an average undertaking with, say, 2,000 street lighting relays and 1,000 water heating relays being switched on and off once a day, 99 per cent reliability would result in 420 relay failures in one week.

With these delicate instruments this would amount to a "headache" of intolerable intensity. Engineers must, therefore, insist on a ripple control system which gives a reliability of the order of 99·99 per cent and employs a simple, robust relay. This necessitates an average ripple signal of about 8 V and actual experience over the past twenty-five years has proved this to be possible.

North Harrow. H. HORWOOD, A.M.I.E.E.

Municipal Reports

Bexhill.—Between 1939 and 1944 the annual sales of electricity dropped from 11·5 million kWh to as little as 4·7 million kWh. Last year, for the first time, the former total was surpassed, consumption amounting to 13·6 million kWh. The borough electrical engineer (Mr. R. C. Carter) says there is no reason why this progress should not continue. Total revenue amounted to £110,142 (£79,674) and working costs were £97,122 (£74,221), the net result being a profit of £1,509 against a loss of £8,408 in 1945-46. The average price received per kWh sold was 1·95d. (1·85d.).

Bury.—The 1946-47 accounts of the Electricity Department (engineer and manager, Mr. J. Mills) record a net surplus of £9,117 against £5,093 in 1945-46. Revenue amounted to £275,460, an increase of £35,297, while working expenses rose by £31,638 to £352,299. Apart from bulk supply, the undertaking sold 46·2 million kWh compared with 38·2 million in the previous year, representing an increase of 21 per cent. The Department itself generated 27·2 million kWh (against 21·8 million in 1945-46).

Shoreditch.—Good progress towards the rehabilitation of the undertaking from the effects of the war is recorded by the borough electrical engineer and manager (Mr. R. H. Rawll) in his report for 1946-47. Although there were only 18,394 consumers at 31st March last compared with 23,449 at the same date in 1939, total sales at 34·7 million kWh slightly exceeded the 1938-39 figure. Compared with 1945-46 they rose by nearly 19 per cent.

An interesting item in the report refers to the supply of 14,931 kWh from the refuse destructor plant. The generating sets, which were brought into commission during the February crisis, are 49 years old and were last used in January, 1941.

The surplus was £13,290 against £1,910 in 1945-46. Gross income amounted to £262,035 (£220,013) and working expenses were £226,021 (£194,748). The average price received per kWh sold was 1·797d. (1·783d.).

PERSONAL and SOCIAL

News of Men and Women of the Industry

THE South West Scotland Electricity Board has appointed **Mr. J. Henderson**, M.C., B.Sc., A.R.T.C., M.I.E.E., as chief engineer to the Board. Mr. Henderson, who is at present deputy engineer and manager of the Ayrshire Electricity Board, was formerly technical engineer for Scotland with the Central Electricity Board, which he joined in 1928, having previously been in the Electricity Departments of the Glasgow and Edinburgh Corporations. He joined the Ayrshire Electricity Board in 1944. Other appointments made by the South West Scotland Board are:—Secretary, **Mr. J. Meek** (town clerk depute, Glasgow); chief accountant, **Mr. C. W. Flint**, A.C.A. (treasurer, Ayrshire Electricity Board); administrative officer, **Mr. W. J. Cooper**, M.I.E.E. (engineer and manager, Hamilton Corporation electricity undertaking).

Mr. J. Henderson

The North Eastern Electricity Board has now appointed **Mr. W. A. Royle**, M.I.Mech.E., M.I.E.E., as its chief commercial officer. Mr. Royle is borough electrical engineer and manager at Sunderland and previously held a similar appointment at Blackburn.

Mr. G. N. Green, M.I.E.E., engineer and manager of the Peterborough Corporation Electricity Department, has been appointed chief engineer of the Eastern Electricity Board. Before going to Peterborough in 1944, Mr. Green had experience with the St. Helens Electricity Department, British Insulated Cables, Ltd., and the Croydon Corporation Electricity Department.

Mr. G. N. Green

Mr. G. A. Robertson, M.Sc. (Tech.), M.I.E.E., M.I.Mech.E., borough electrical engineer, Preston, has been appointed manager of the No. 4 sub-area (Preston) under the North Western Electricity Board.

Mr. J. W. Chant, formerly in the town clerk's department, Sheffield, has been appointed secretary to the North Western Electricity Board, and **Mr. A. O. Johnson**, borough electrical engineer of Wigan, has been appointed chief commercial officer.

Mr. W. C. Parker, borough electrical engineer of Fulham, who has been appointed controller of the South Eastern Division under the British Electricity Authority, has notified Fulham Council that if he is seconded to the service of the B.E.A. he will be able to devote two days a week to the Fulham Electricity Department. The salary attached to his new appointment will be £3,000 and the Staff Committee has recommended the Council that, subject to the B.E.A.'s reimbursing to the Council the amount of the salary receivable by Mr. Parker in respect of his appointment with the Authority from 1st February until vesting day (April 1st), his salary should be increased to £3,000 per annum as from 1st February.

Mr. E. Maxwell, town chamberlain, Kirkcaldy, has been appointed chief accountant to the South East Scotland Electricity Board.

Mr. W. Moody, sales manager of the Yorkshire Electric Power Co. for twelve years, has been appointed sub-area manager of No. 5 Area of the Yorkshire Electricity Board.

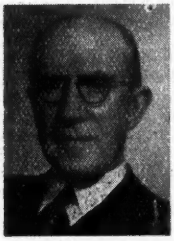
Dr. R. C. G. Williams, M.I.E.E., M.I.Mech.E., has been appointed chief engineer of Philips Electrical, Ltd., to advise the managing director on all technical matters. Dr. Williams joined Philips direct from the North American Philips Co., Inc., of New York, where, as an executive engineer, he gained experience in American industrial methods and developments in the electrical and allied fields and manufacturing technique. He is retaining his connection with the American group as technical adviser to North American Philips. Before he went to America, Dr. Williams held posts in control of design and manufacture with Murphy Radio, Ltd.

Dr. R. C. G. Williams

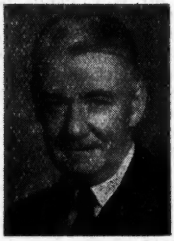
Dr. J. W. Bondi, a director of British Oil Engines (Export), Ltd., is going on a three months' tour of North and West Africa. He will visit existing agents and will make a general market survey of the various territories visited.

Mr. W. A. Coates, M.I.E.E., Fel.A.I.E.E., manager, Home Sales, of the Metropolitan-Vickers Electrical Co., Ltd., since 1946, has been appointed to the board of the company. Mr. Coates joined the British Westinghouse Co. (which later became the Metropolitan-Vickers Co.) in 1909, and with the exception of the period 1912-15, when he was chief engineer of the Ferranti Electrical Co. of Canada, he has

remained with it since that date. For some years he was engaged on export work, after which he became chief engineer of the M-V Switchgear Department in 1919, and was responsible for the development of the company's first metalclad



Mr. W. A. Coates



Mr. W. Symes

switchgear and h.v. outdoor switchgear. From 1922 to 1927 he was again engaged in the export field, but then returned to specialized work in switchgear until 1946. Mr. Coates continues to hold the position of manager, Home Sales.

Mr. W. Symes, M.I.P.E., works manager since 1944 of the Metropolitan-Vickers Electrical Co.'s main works at Trafford Park and its various dispersal factories, has also been appointed to the board. After early work with the B.T.H. Co. at Rugby, Mr. Symes joined Metropolitan-Vickers in 1914, and was successively engaged in design work and time and motion studies. As superintendent of the Detail Department he supervised new factory extensions of 250,000 sq ft floor area for the company's first war contract. As works manager Mr. Symes has planned the company's post-war factory reorganization including extensions amounting to over 1,000,000 sq ft floor area.

Mr. G. H. Fletcher, M.I.E.E., M.I.Mech.E., chief engineer and manager of the Metropolitan-Vickers Attercliffe Common Works, Sheffield, who has just been appointed to the Board of the Metropolitan-Vickers Electrical Export Company, is an authority on electric traction and has wide interests in engineering in general. After his technical education at the Victoria Technical College, Preston, and an apprenticeship with Dick Kerr & Co., he joined the British Westinghouse Co. at Trafford Park in 1914. He was responsible for the design of industrial and traction motors. In 1922, when the manufacture of traction motors was transferred to Sheffield, Mr. Fletcher became chief engineer, and in 1930 he became manager also. Since 1938 he has been chairman of the British Standards Institution Technical Committee EL/44: Electrical Equipment of Traction Vehicles. In 1937 he was president of the "Comité Mixte," an international body representing electrical and transport undertakings.

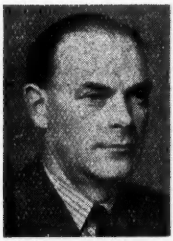
Mr. G. H. Fletcher

Mr. R. H. S. Turner, M.A., has been appointed superintendent of the Plant Department of the Metropolitan-Vickers Electrical Co., Ltd., in succession to the late Mr. F. A. Pucknell.

Mr. R. H. S. Turner

Mr. W. Randall, M.C., A.M.I.E.E., has now left the India Supply Commission, Mount Street, W.1, and is continuing his work on behalf of Indian industrialists with manufacturers in the United Kingdom. Until further notice his address will be 27, Lennox Gardens, Ilford, Essex (Telephone No. : Valentine 2185).

It is announced by Marconi's Wireless Telegraph Co., Ltd., that **Mr. J. G. Robb,** deputy engineer-in-chief and chief of the company's research laboratories, has been appointed chief of a new engineering division in connection with associated companies. He is succeeded as chief of research by **Mr. R. J. Kemp,** who was his chief assistant.



Mr. R. J. Kemp

Mr. H. R. Neilson and **Mr. I. M. Stewart** have been appointed directors of Glenfield & Kennedy.

Mr. E. W. Griffiths, A.M.I.E.E., has been appointed deputy engineer in the Electricity Department of the Hawarden Rural District Council.

Mr. S. W. Fuller has resigned his post as sales director of Trustful Products, Ltd. His home address is "Townfield House," Great Wakering, Essex.

Mr. W. S. Gearing

Mr. W. S. Gearing, A.M.I.E.E., acting manager of the London branch of Johnson & Phillips, Ltd., has now been appointed London branch manager.

Mr. B. C. Cadman has resigned from C. M. Churchouse, Ltd., to join the board of Purdy

& Hunt, Ltd., electrical fittings manufacturers of Northampton.

Mr. R. F. McInnes, B.E., A.M.I.E.E., has been appointed a director of Aidas Electric, Ltd. Mr. McInnes joined the company as an engineering assistant in 1933 and was appointed sales manager in 1936, a position he still holds.

E.M.F. (Electrical) Ltd., electrical wholesalers, Northampton, held a very successful party for its staff and their friends at the Rogers Hall on 7th February. The managing director, Mr. V. H. Purdy welcomed those present.

Obituary

Mr. B. Horn.—We regret to record the death, which occurred suddenly at his home at Barton, near Luton, on 31st January, at the age of sixty-six, of Mr. Bertram Horn, who for over thirty-seven years represented Mirrlees Bickerton & Day, Ltd., and the Mirrlees Watson Co., Ltd., in the South of England and the Midlands.

A memorial service to the late **Mr. F. S. Button,** C.B.E., J.P., will be held at St. Margaret's, Westminster, on 24th February, at 12.30 p.m.

WILLS.—Sir Francis Minchin Voules, chairman of the Para Telephone Company, left £81,748 (net personalty £81,128).

Sir Standen Leonard Pearce, engineer-in-chief and a director of the London Power Co., left £88,517 (net personalty £84,143).

Mr. Legh Sylvester Powell, M.I.E.E., a pioneer of electric lamp development, left £25,208 (net personalty £25,115).

7½-million-kVA Circuit Breaker

SHORT circuit tests of more than twice the kVA rating of any breaker now in service are reported to have been applied at the Grand Coulee power plant, U.S.A. The breaker is a dead-tank single-phase unit with multi-flow De-ion grid interrupters. Its tank is only 7 ft (2·1 m) in diameter, against the 9 ft (2·7 m) standard four years ago for 3,500,000-kVA ratings. The oil volume has been reduced by almost one half. Compressed-air mechanism for high-speed reclosure was employed.

The entire Bonneville system and North-West power pool were tied together through six 230-kV transmission lines into the Coulee outdoor station and paralleled with all six of the existing 108,000-kVA generator and transformer units installed in the power house. The breaker was tripped so that a fault current was established just as the contacts began to separate. In the last of a group of fifteen tests the total r.m.s. currents reached 17,800 and 18,200 A, corresponding to a three-phase fault of 7,500,000 kVA at 230 kV. All interruptions took place within the rated time of three cycles; one test showed only a single asymmetrical current loop and cleared within 1·85 cycles after the tripping impulse.

In a second series of tests using high-speed reclosing with 60-cycle and 18-cycle intervals, double interruptions were handled successfully up to full power. The maximum current was 14,550 A (inasmuch as pre-tripping could not be arranged) equivalent to a three-phase fault of 6,000,000 kVA. The interrupters had been previously tested in the East Pittsburgh high-power laboratory up to currents representing 9,000,000 kVA by using 66 kV, or half the normal line-to-earth voltage across a single grid. As a result of these tests, the construction of three-cycle, 230-kV breakers rated at 10,000,000 kVA on 20-cycle reclosing duty is regarded as a possibility.

Owen Falls Project

WHILE in East Africa the Paymaster-General (Mr. Marquand) last week visited Jinja in Uganda where, states *The Times*' correspondent, he saw the site selected for the Lake Victoria hydro-electric scheme at Owen Falls. Besides providing power for Uganda's fast developing industries, this project—if agreement is reached with the Egyptian Government—may be broadened so as to regulate the flow of the Nile and keep a reserve which would permanently ensure Egypt's water supplies. For this purpose the level of the lake would be raised 1·3 m above maximum recorded level and a dam would be built at Mutir to create a balancing reservoir in Lake Albert. The Nile, flowing out of Lake Victoria over the Ripon and Owen Falls, passes between high cliffs only 675 ft (206 m) apart, and so far as the purely power generation scheme is concerned the water could be harnessed at a comparatively low cost.

I.E.E. Radio Convention

THE Radio Section of the Institution of Electrical Engineers is holding a convention on scientific radio on 7th and 8th April, jointly with the British National Committee for Scientific Radio (set up under the auspices of the Royal Society). The Convention, which will be held at the Institution, Savoy Place, London, W.C.2, is intended to serve as a preliminary survey of the British contribution in the radio field which is to be presented at the forthcoming meeting of the Union Radio Scientifique Internationale to be held in Augus next in Stockholm.

There will be four sessions. The first, under the chairmanship of Mr. P. Good, the president of the I.E.E., will deal with Standards and Measurements; the second, Propagation (chairman, Sir Edward Appleton); the third, Radio Noise (chairman, Sir Robert Watson-Watt); and the final session, Radio Physics (chairman, Prof. G. I. Finch).

Public Utilities

Meeting of Conjoint Conference

AT the annual meeting of the Conjoint Conference of Public Utility Associations on 11th February, the president (Viscount Falmouth) in moving the adoption of the report referred to the nationalization of electricity supply and transport. The Conference, in co-operation with the associations concerned, had taken action and although the Government was unyielding in all matters of principle many improvements had been introduced during the committee stage of the Bills, including the provisions in the Electricity Act permitting composite companies to retain the non-electrical side of theit undertakings.

Lord Falmouth congratulated Mr. H. F. Carpenter, a member of the Council for many years, upon his appointment as secretary of the British Electricity Authority and he also paid tribute to the spirit of co-operation which had been exhibited by the five electrical associations which were being wound up with the transfer of electricity supply to public ownership. After mentioning the Gas Bill, Lord Falmouth said that owing to the nationalization measures the gas and electricity member associations had found it difficult to consider other matters by which they were less directly affected, but the Conference had been able to relieve them to some extent.

The adjustment of the relationship between local authorities and public utilities brought about by the Town and Country Planning Act had been discussed with the Ministry. As a result, the compromise devised by the 1944 Act had been preserved and the satisfactory compensatory provisions of the Act would remain applicable.

Cables in Highways

No settlement had been reached of the well-worn subject of mains and cables in highways because of the failure of the County Councils Association to agree to the clause negotiated by its own representative. Nevertheless, the importance of a settlement had been drawn to the Government's attention by the inclusion of the clause in their Bills by two gas companies, although these Bills were withdrawn. The Ministry of Transport had called a conference of the interested parties who accepted as a basis of negotiation the Carnock Report which strongly supported the views of the Conjoint Conference.

Consequently there seemed to be every prospect of obtaining such a measure of agreement as to justify the Government's introducing next session a comprehensive Bill dealing with the use of highways by public utilities, covering also Post Office apparatus and district heating schemes.

Opposition was offered to the district heating clauses of the L.C.C. (General Powers) Act and as a result it was secured that a local authority's district heating scheme should be operated as a separate undertaking.

With the winding-up of the electrical and gas associations the Conjoint Conference would be unable to continue, at any rate under its present constitution. It was thought desirable, however, to keep the Conference in existence although its functions might be nominal to a large extent. The question of continuance would be re-examined in the light of subsequent developments.

Scottish Water-Power Plant

Manufacture at Scotstoun

MANY distinguished guests including Mr. Tom Johnston, chairman of the North of Scotland Hydro-Electric Board, were present last week at a visit to the Scotstoun works of Harland & Wolff, Ltd., which in close collaboration with the English Electric Co., Ltd., is manufacturing large hydro-electric plant for the North of Scotland Hydro-Electric Board. Speaking at the works, the Lord Provost of Glasgow (Sir Hector McNeill) said that this was the beginning of a new and welcome industry on Clydeside.

Sir George Nelson, chairman of the English Electric Co., said that he had always been a believer in the value to Scotland of hydro-electric development. His company and its associates had promoted several Bills for the purpose but with the exception of the Galloway and Falls of Clyde schemes they had all been rejected. The English Electric Co. had backed its faith in water power by spending considerable sums in research and as a result had achieved a world-wide reputation for hydro-electric plant.

Some of the equipment under construction at Scotstoun, to the design of the English Electric Co., is for the Loch Sloy project which forms part of the Board's first constructional scheme, which, with an additional catchment area, will give an annual output substantially in excess of 100 million kWh. This scheme involves the construction of a dam at Loch Sloy, the driving of a tunnel through Ben Vorlich and the erection of a power station which will have a capacity of 130 MW. The Board has main contracts valued at £3,500,000 for the work on this project with about fifty companies.

The four vertical shaft type Francis turbo-alternators and ancillary machinery which will be supplied and erected by the English Electric Co. are now in course of manufacture at Scotstoun. Each of the sets will develop 46,000 h.p. at 428 r.p.m. and will be rated at 32,500 kW. Also to be constructed for the Board is a 56,000-h.p. water turbine and 40-MW alternator for installation at Clachan. Other water turbines in hand at Scotstoun are one of 36,000 h.p. for New Zealand, three 20,000-h.p. turbines and three 4,000-kW alternators for India, and a 10,000-h.p. turbine for Ceylon.

RECENT INTRODUCTIONS

Notes on New Electrical and Allied Products

Mercury Rectifiers

RECTIFIERS of the mercury vapour valve type for deriving d.c. from a.c. mains for various industrial needs are produeed by PHILIPS ELECTRICAL, LTD., Century House, Shaftesbury Avenue, London, W.C.2. They are obtainable in " chassis " form for building into other equipment, or as self-contained outfits enclosed in steel housings which contain all the necessary ballast resistances, or chokes, as well as the fuses and switchgear. A typical rectifier designed for three-phase operation is, for example, capable of furnishing a d.c. output of 20 kW at 250 V. The modernized casings, stove enamelled, are constructed of angle iron frames with sheet steel panels and are well ventilated.

Table Lamps

Lightweight metal table lamps are now being manufactured by the ART METAL CO., Aston, Birmingham. These " Amco " table lamps, which incorporate push-button switches in their bases, can be supplied with bayonet cap or Edison screw lampholders. The design is modernistic and either " crackle " or polished finishes are available in a variety of colours.

" Perfect " coffee percolator

Coffee Percolator

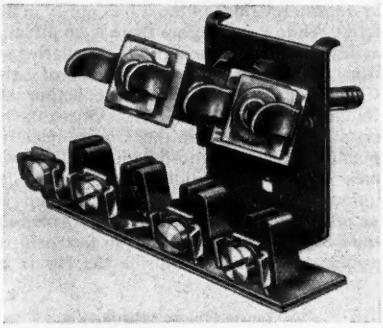
A polished aluminium or chromium plated copper coffee percolator with black anodized base is offered by ELECTRO TECHNICAL INDUSTRIES, LTD., 15, Islington Park Street, London, N.1. This " Perfect " percolator has a power consumption of 400 W and may be used on a.c. or d.c. mains 200-220 V, 230-250 V or 100-150 V. The weight is 3 lb (1·36 kg) and overall height 12 in. (30·5 cm).

Portable Radiant Warmer

A portable space heater designed for the provision of a gentle radiant warmth and the offsetting of cold spots in rooms is an addition to the " Medrae " range of products. The panel of this warmer is manufactured from an asbestos fibre base material bonded under heat pressure with thermosetting phenolic resin, the heating element being embedded during this process. The total loading is 600 W, which corresponds to a low surface temperature of approximately 160 deg F (71 deg C). All home sales are handled by the DULRAE MANUFACTURING CO., LTD., 156, Great Portland Street, London, W.1, and export sales by the parent company RICHARD CRITTALL & CO., LTD., of the same address.

Heater Switches

To facilitate the production of its own fires and heaters the REVO ELECTRIC CO., LTD., Tipton, Staffs, has commenced to make a range of switches which are equally suitable for hand or foot operation. They are of 5A at 250-V rating, both single and double pole models being secured by a milled collar or screws through two tapped holes. The fixed contacts can be at the top or bottom, the action is of the quick make and break type and all the insulation is mica. The frame is rust-proofed and the dolly and saddle are nickel-plated.



Double pole " Revo " heater switch

Synthetic Fabrics

Two unusual materials of many uses are available in a variety of colours from HYALON, LTD., 293, Oldfield Road, Salford, 5, Lancs. One of them is named " Suedyl " because it is suède-like while the other, which is of velvety texture, is described as having a rayon " Flexyl " finish; in both cases the reverse surface is of rubber-like smoothness.

These materials can be used for covering turntables, rendering the bases of table lamps non-slip and lining instrument cases. They can be moulded to the exact shape and size of the box, ready for fixing in position by means of a special adhesive without cutting or stamping-out. Alternatively the sheets can be moulded on to backing paper to enable ordinary box-makers' adhesives to be employed. These materials may be made thick for resilience, or so thin that they can be ruffled and pleated similarly to fine silk.

Industry and the House

Sir Stafford Cripps's Task

By F. J. Erroll, M.A., A.M.I.E.E., M.P.

THE fight to defeat inflation goes on, and the announcements by the Prime Minister on wages and by Sir Stafford Cripps on controlled prices have given an added sense of urgency to the struggle. The effectiveness of both measures cannot be known for some time, and there will doubtless be *in transitu* revisions of the wages policy in the latest White Paper before there is an attempt at legislative implementation. Similarly, we can expect further definition of the Chancellor's pegging of prices before his Budget is opened in April. One can be certain, however, that the Government, in pursuing this new anti-inflation policy, will face critical opposition from the trades unions; from the managerial division of industry; and from the consumer "man-in-the-street." The opposition, in fact, will be principally conducted outside the House of Commons.

Trade Union Attitude

The immediate reaction of the Trades Union Congress to the wages policy indicates that a crisis within the Socialist Party is inevitable. In defiance of the White Paper many thousands of trade union members at once decided to press their claims, and in the House a considerable number of Labour Members demanded the rejection of the White Paper. Perhaps the Chancellor will be able to force the trade unions into co-operation on the wages policy. Conversely the opposition to this White Paper may increase to an extent where substantial amendments are necessary, in which case his important, even vital position in the Government would become invidious.

Wage levels have, of course, a particular significance in their effect on the price of goods. The cost of exported goods must not be allowed to rise above a certain competitive level, and recently there has been considerable concern at the already high prices, resulting in a falling off of export quotas. The stabilization of wage levels may have a salutary effect on export costs. But what of the prices of goods for internal consumption? The prices of domestic goods, are well above 1939 levels. To balance this increase in the cost of living there have been adjustments of wages in many industries. But many sections of the working public are suffering badly from an inability to balance domestic budgets.

A Government announcement that all state-controlled industries were to be subject to the plan to freeze prices should have taken priority over the previous statements concerning prices of goods outside the State's control. The Minister of Fuel is now responsible for fixing the prices of coal, oil and electricity, and gas prices will shortly come under his care. Here again there must be reconciliation between the unions' continued claims for wage increases and the Government's stand against increased prices. How, for instance, will Sir Stafford Cripps and Mr. Gaitskell react to the statement made by the chairman of the North Western Electricity Board on 13th February that the cost of electricity in this region would be raised before 1st April by a fraction of a penny per kWh ? And if the coal-mining industry is to be exempted—as an undermanned industry—from the principles laid down in the White Paper, how can the Government avert increases in the mining industry having a snowball effect on wages and prices in other industries dependent upon coal ?

Opposition's Support

There is, as yet, no significant division in the House on the Government's wages and prices policy. In last week's debate Mr. Eden said that although the main issue of the White Paper was that of inflation, that issue was intimately bound up with the problem of our balance of payments. No partial solution could measure up to the grim facts of the national emergency, nor could any policy that failed to hold the scales evenly between different sections of the community claim the united support of the House and the nation. If the Government's policy was to avoid this then it had the support of the Opposition.

Sir Stafford Cripps has already shown himself capable of firm decisive temper in the broad handling of this nation's economic affairs. Now even firmer action is required and in view of the opposition aroused Parliament and public alike await events with justifiable anxiety.

PARLIAMENTARY NEWS

By Our Special Reporter

IN the House of Commons last week, Mr. MacLeod asked the Secretary of State for Scotland whether he had any statement to make on the subject of development of industry in the areas nearest to the source of the new hydro-electric supply.

Mr. Woodburn said that the North of Scotland Hydro-Electric Board was in negotiation with a number of firms considering developments in the Highlands based on hydro-electric power. The Government would do all it could to assist and he was considering how the investigation could best be carried further.

Staggered Hours Suspension

The Minister of Labour (Mr. Isaacs) told Mr. S. Shepherd that the Regional Boards for Industry and their district and other committees were being asked to suspend arrangements for spreading electricity load from 29th March. It was essential, however, that all users of electricity should continue to exercise the utmost economy should any cold spell occur and particularly during the morning peak hours between 8 a.m. and 12 noon. This applied with particular force to domestic and other non-industrial users. The problem which would recur next autumn would be no less serious than that which faced us last autumn, and staggered hours would have to be re-introduced at about the same period as last year.

Power Station Construction

Colonel Wheatley asked the Minister of Fuel and Power whether he was satisfied that the actual progress made up to the 31st January in the construction of the power stations at West Ham, Poplar, Deptford and Bankside was in accordance with the programme as originally planned.

Mr. Gaitskell said that the original programmes had to be revised in the light of various difficulties arising from the war, which prevented their being started on time. Further revisions were recently made in accordance with capital investment policy. He considered that the actual progress made on these four stations was satisfactory having regard to these revisions.

Gas Nationalization

Minister on Co-ordination of Fuel Industries

AFTER a two-day debate, the House of Commons last week gave the Gas Bill a second reading. Mr. Gaitskell, Minister of Fuel and Power, in moving the second reading, said that one of the arguments for the re-organization of the industry under public ownership was that since coal and electricity had already been nationalized, gas must be also. That was not an æsthetic argument based on the beauties of symmetry; it was much more fundamental. Could they really conceive of the gas industry, in its present antiquated form, being able to compete effectively with electricity ? How could co-ordination in fuel and power be achieved unless there was public ownership of all three interests ? The case for public ownership of the gas industry was a powerful one on its own merits.

One argument against nationalization was that there would no longer be competition between gas and electricity. That was a complete misconception; it was intended that competition, restricted in certain ways, should continue. Otherwise they would have set up boards to run both gas and electricity.

In applying the principles of public ownership there were important differences from the Electricity Act. Here the Area Boards were the centre of the picture, the main instrument through which the benefits of the reorganization of the industry would accrue to consumers in the shape of better and cheaper gas and coke. They were not giving area boards the main responsibility because they thought there had been over-centralization in other cases, but because here there was no national grid. Gas was a local service and should be to a great extent decentralized, but there must be a central body, mainly advisory and federal in character, and that was provided by the Gas Council.

The Electricity Act made no provision for preventing municipal undertakings disposing of their assets in certain ways so that they were not available to the new boards. There had been cases in which rebates had been granted to consumers as a sort of parting gift. Therefore, he had that day made an order prohibiting the granting of rebates—except the ordinary discount-for-cash type—and at the same time preventing a reduction in charges. The same thing had been happening to some extent in the case of gas, and therefore a similar order was being applied to gas.

The Government had provided that the National Coal Board and the Gas Area Boards must co-operate in the capital development of carbonization. They were jointly to work out schemes. He was hoping very shortly to announce the appointment of a scientific advisory council to the Ministry of Fuel and

Power and a chief scientific adviser who would probably be the chairman of the council. Their job would be to co-ordinate research in fuel and power as a whole. The council would include the chief scientific advisers to the nationalized industries together with some independent scientists. Referring again to competition, Mr. Gaitskell said that while the consumers should be allowed a free choice that choice should be influenced by reference to costs.

In the debate which followed, Mr. Bracken said that the gas industry was recognized as the most efficient in Europe and had plenty of admirers in the United States. It had had to fight for its life. The pioneers of electricity, gloating over the impending doom of gas, were more arrogant than the railway pioneers over the doom of the stage coach. Competition had sometimes been unfair, but the gas industry had accepted the challenge.

Gas should not be complementary to electricity; in the public interest they should be fiercely competitive. If the gas industry were tied to the National Coal Board inside the Ministry of Fuel and Power it would be hamstrung. Integration of the gas industry could be achieved by appointing Gas Commissioners with wider powers and a better-paid staff than those possessed by the Electricity Commissioners. They should be empowered to call upon the industry for plans for integration, and to amend them where necessary and they should have powers to compel them to be carried out.

Many speakers continued the debate. One of them, Sir Peter Bennett, said that the power of the Gas Council to manufacture and sell equipment and fittings was a serious matter.

Mr. Ernest Davies hoped the Minister would exercise a measure of control over policy and would answer to the House for that control.

Mr. Bower said that on the Government's own showing the fact that coal and electricity had been nationalized was a very good reason why gas should not.

Mr. Walter Elliot moved the rejection, of the Bill, describing its introduction as "folly and recklessness."

Mr. Herbert Morrison, in winding up the debate, said it was fair to say that some of the gas undertakings were very well managed, and had given electricity a pretty sharp run for its money. There were a fair number of undertakings which were highly efficient, within the technical limitations under which they were working. There were others not so good and some that were bad, partly because the units were so small. That was equally true of electricity.

In conclusion, Mr. Morrison said that an efficiently conducted socialized electricity service would win decisively against a privately-owned gas business. He believed it was in the public interest that the gas industry should be taken over in the way proposed.

The motion for rejection was negatived and the Bill was read a second time.

Eliminating Unsafe Appliances

Establishment of E.D.A. Testing House

WITH a view to maintaining the tradition of safe design of electrical appliances and accessories, the British Electrical Development Association, which is representative of electricity supply authorities familiar with the experience of users, has established a testing house. As the result of discussions with the British Standards Institution, representing the electrical industry and users, an Advisory Committee on Electrical Appliances and Accessories, with Mr. F. Newey as chairman, has been appointed, consisting of eight members of each body, two representatives of the Institution of Electrical Engineers, and a representative of the Electrical Association for Women. Mr. R. Harvey, who has been on the staff of the G.E.C. Research Laboratories, Wembley, since 1931, has been appointed manager of the testing house.

The aim of the Committee, in the first place, is to eliminate unsatisfactory appliances and accessories, rather than to approve satisfactory apparatus. Its procedure is to invite any interested person or body to submit any electrical appliance or accessory deemed to be unsafe and to arrange for it to be tested without charge to the sender. If the apparatus is judged to be safe the Committee will inform the sender that it has no objection to raise, but if otherwise the Committee will approach the manufacturer or importer with a view to improvements. In addition the Committee may make recommendations to the B.S.I. for the preparation of additional domestic appliance specifications suitable as a basis for certification by means of the B.S.I. Mark Scheme. Experience thus gained is expected to be of value to authorities concerned with the desirability or otherwise of introducing legislation to prevent the sale of unsafe appliances.

Manufacturers or importers will be discouraged from publicizing any decision of the Committee, since if this is favourable it means that the apparatus merely joins the ranks of the great majority of electrical appliances which are as safe as human ingenuity can make them, while in the case of an adverse decision the manufacturer will be advised privately. Manufacturers in doubt as to safety requirements will, it is expected, submit samples of new designs in advance of commercial production.

Any person or body who believes an appliance or accessory to be unsafe should send it, with a letter stating the grounds of complaint, to the Secretary, Advisory Committee on Electrical Appliances and Accessories, 2, Savoy Hill, London, W.C.2.

COMMERCE and INDUSTRY

E.T.U. and "Frozen" Wages. Future of Liverpool Committee.

At a meeting of the Executive Council of the Electrical Trades Union there was an interim discussion on the Government's White Paper, "Statement on Personal Incomes, Costs and Prices." It was appreciated that a comprehensive examination of the White Paper would have to be made before the meeting of the executive councils of affiliated unions that the General Council of the Trades Union Congress was proposing to call, but meanwhile the Executive Council has decided that it will pursue all existing wage claims that have been made on behalf of its members.

Electricity Committee to Continue

It has been suggested in the *Electrical Review* that some municipal authorities upon parting with their electricity undertakings might consider it desirable to retain their Electricity Committees to keep an eye on electrical matters as they affected their ratepayers. Last week the Liverpool Electric Power and Lighting Committee held a special meeting, with its chairman (Alderman A. Critchley) presiding, to consider the Committee's future. It was decided that there were sufficient important electrical undertakings in the city to warrant the existence of an Electricity Committee—such as street lighting, electrical installations in the many public buildings, the Mersey Tunnel and work for other public bodies and Government Departments.

System Change-over Dispute

In the Chancery Division on 10th February Mr. Justice Jenkins heard a motion by the London Investment & Mortgage Co., Ltd., asking for an interim injunction restraining Central London Electricity, Ltd., from discontinuing the supply of electricity to the plaintiffs' premises in Charing Cross Road, W.C.2.

It was stated for the plaintiffs that they had taken over premises supplied with direct current and the defendant company had asked them to undertake to pay the cost of conversion to alternating current (over £1,000) before continuing the supply.

The defendants' case was that the plaintiffs were told when they acquired the premises that the system was to be changed and were offered a d.c. supply on the condition that they altered their plant in due course. They were not entitled to a supply until they signed a contract.

In dismissing the motion, His Lordship said that he did not think that the plaintiffs could refuse to enter into a written contract and when they did enter into a contract they would be entitled to a supply on the system declared by the defendant company. The plaintiffs had no right to insist on the maintenance of the d.c. supply. The defendant company was willing to provide an a.c. supply under a contract so that there was no breach of statutory duty on its part if the plaintiffs refused to sign a contract.

Shortage of Electrical Apprentices

The present reluctance on the part of boys to enter the electrical engineering industry has been demonstrated in the returns of the Glasgow Careers Council. These show that out of 605 secondary school pupils handled under the Careers Council scheme, only seven apprentice electrical engineers were obtained. The great majority of the boys and girls passing through the Council's hands took employment as chartered accountants, bankers, Government and local government employees.

Washing Machine Display

A window display installed at Crown House, Aldwych, W.C.2, by the Hotpoint Electric Appliance Co., Ltd., presents the application of the company's standard domestic electric cabinet washing and wringing machine for use on board ships of medium size carrying a limited number of passengers. An unusual feature for a ship of this type is the electric laundry fitted in the deck house at the aft end of the upper deck. The display depicts the new motor-cargo liner

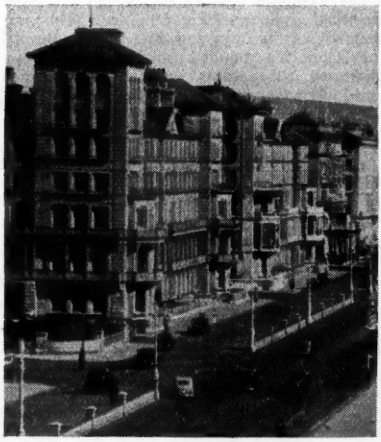
Hotpoint window display at Crown House, Aldwych

Langleescot, while *La Cordillera*, which is under the same management, is similarly equipped with Hotpoint washing machines and ironers among other domestic electrical appliances supplied for these vessels. Hotpoint domestic electric laundry equipment has also been supplied for six recently built cargo-passenger vessels of the Harrison Line.

South Eastern Board's Headquarters

To accommodate a staff estimated at 300, the South Eastern Electricity Board has acquired the Prince's Hotel, Hove, at a cost of £165,000. The hotel was used as a naval barracks during the war and has since remained unoccupied.

The acquisition was discussed at a meeting of the Hove Town Council on 12th February when several members objected to a hotel being diverted from its proper purpose to the housing of the Board's staff. On the other hand a councillor said that the site was originally occupied by houses which were converted into



The Prince's Hotel, Hove, acquired by the South Eastern Electricity Board is seen in the foreground of this picture

a hotel which had not been very successful. He said that the Board would bring " kudos " to Hove.

The Council agreed to grant the Board interim development permission to use the premises as offices for a period of ten years.

Plessey Overseas Expansion

Plans for development and manufacture, throughout the world, are being prepared by the Plessey Co., Ltd., of Ilford, which is forming new organizations for the expansion of overseas trade. Communication Components, Ltd., is being established in Dublin, Eire, to develop, manufacture and sell a complete range of radio components (other than valves) and light engineering equipment. Temporary premises having a floor space of 13,000 sq ft (1,208 sq m) have been opened in Marrowbone Lane, Dublin, while permanent factory and office buildings are being erected on a recently acquired site. The Plessey International, Ltd., has been formed which will deal with all countries with the exception of Eire. It will control and develop all Plessey exports and form a medium for the exchange of technical information in the radio and light engineering fields between Britain and other countries.

E.D.A. at Agricultural Shows

It has been decided by the Council of the British Electrical Development Association to remit to the General Purposes Committee for consideration and report a proposal that electrical exhibits shall be provided at the principal agricultural shows this year at a total cost of £12,000.

The amount includes £3,000 for the Royal Show at York and £1,000 each for the Highland, Royal Welsh, Royal Ulster, and the Bath and West Shows, £600 for the Dairy Show and £250 for the Chelsea Flower Show. A sum of £1,000 is to be contributed towards the cost of supplying electricity to the Royal Show.

" Electrical Review " Index

Readers who wish to secure a copy of the index to Volume CLXI of the *Electrical Review* (July-December, 1947), which is now available, should apply to the Publisher. *Electrical Review*, Dorset House, Stamford Street, London, S.E.1.

" Sirocco " War Contribution

Davidson & Co., Ltd., in common with other engineering concerns, devoted their energies during the war to the supply of equipment for works engaged in the production of war materials, and for the three Services. A well-illustrated booklet has now been published by the company giving some idea of its many activities during the war in supplying ventilating, air conditioning and other plant for factories, air-raid shelters, H.M. ships, aircraft and tanks.

Radar Navigational Aids

Radar aids to navigation, in particular the " Seascan," were described in a film shown to members of the Radio Industry Council in London last week by the Metropolitan-Vickers Electrical Co., Ltd.

The first section of the film was devoted to an explanation of the various fundamental ideas connected with radar, such as the action of reflecting radio waves and the operation of the cathode-ray tube. This was accomplished with the aid of diagrams in such a manner that even the most uninformed could follow. Some time was devoted to illustrating the constructional details of the " Seascan " and many views

of the research laboratories and factory workshops were shown. After an idea of the operation of the complete unit had been conveyed a "sped up" picture of the cathode-ray tube screen was shown throughout a complete journey by ship from Liverpool to Greenock. This clearly indicated how radar facilitates the navigation of ships under adverse fog conditions when visibility is almost nil.

Electricity Intake for Flats

The Codes of Practice Committee has issued as a draft for comment, Code 322.102, "Electricity Supply Intake Arrangements for Flats and other Multi-occupier Buildings," prepared by a Committee convened by the Institution of Electrical Engineers. The draft code contains recommendations for the installation of rising and lateral electricity conductors, lists relevant British Standards, and emphasizes the need for liaison between the building designer, contracting parties and owner in selecting the type and arrangement of equipment.

Reference is made to alternative systems of service through an external system of low- or medium-voltage mains or through a transformer substation. Details are given of sizes, types and finishes of vertical ducts or chases for rising mains with advice on the choice of systems as listed and sizes of conductors to be installed under varying conditions, and on the selection of distribution fuse boards and ancillary design features. Comments should be submitted by 24th March. Copies, reference CP(B)717, may be obtained from the British Standards Institution, 24-28, Victoria Street, London, S.W.1, price 2s. post free.

E.D.A. Sales Conference

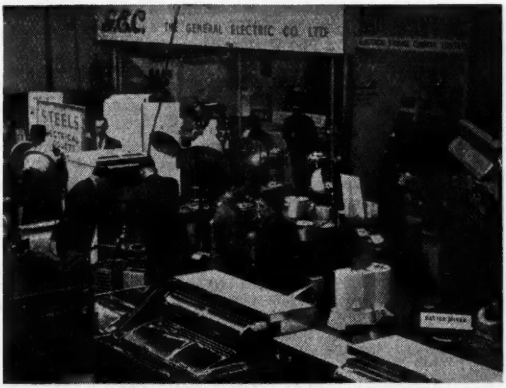
The January sales meeting of the North West England and North Wales E.D.A. Area was held at the Chorley showrooms of the Lancashire Electric Power Co. Mr. R. A. S. Thwaites, deputy chairman, Alderman H. E. Rhodes, member, and Mr. O. Howarth, chief engineer, North Western Electricity Board, were present at the meeting. At the luncheon, delegates were welcomed by Mr. S. M. Rix, deputy secretary of the British Electricity Authority.

Equipment in the "Andes"

The Royal Mail liner *Andes* of 26,000 tons was completed on the outbreak of war for South American service, but she was taken over as a troopship. After the war she was reconverted as a passenger liner. The electrical equipment on board is considerable and the G.E.C. has provided the telephone installation, the lighting equipment for both first and second class dining rooms, lounges, etc., as well as three 1,000-kW turbo-generators.

Hospital and Catering Aids

A three-day Hospital and Catering Electrical Aids Exhibition was held in Cardiff last week under the auspices of the British Electrical Development Association. The Minister of Health sent a message in which he referred to the drudgery which had made recruitment to the nursing profession difficult and said he was anxious that the skill of nurses should be devoted to the care of the patients. Dr. J. Walker, Deputy Lord Mayor of Cardiff, opened the exhibition and was introduced by Mr. E. Jones, deputy chairman of the South Wales Electricity Board and chairman of the E.D.A. South Wales Area Committee.



View of Hospital and Catering Aids Exhibition, Cardiff

Apparatus shown on the twenty-eight stands included a two-compartment dishwasher which washes and dries 1,000 pieces an hour—one of the machines selected by Princess Elizabeth as her wedding gift from Leamington Spa—a super steam cooker, portable X-ray units, apparatus for short-wage therapy, electric cooking ranges, electrically heated hot-plates and food trolleys, electrically heated blankets, foot muffs and gloves, a baking oven, fish-frying ranges, potato chippers, batter mixers and potato peelers.

American Wage Rates

In the January *Ministry of Labour Gazette* are reproduced some details of wage rates published by the Bureau of Labor Statistics of the United States Department of Labour. In the case of the machinery industries the figures were based on an inquiry relating to earnings in October, 1946, of workers employed in undertakings representing about half a million workers in areas with a population of 100,000 or more. Roughly half of the under-

takings worked a 40-hour week. The average "straight time" earnings (i.e. exclusive of extra payments for overtime and night work) were $1·22 per hour, against $0·98 in January, 1945. An analysis of the group gives the average hourly earnings of maintenance electricians as $1·39.

A survey of earnings in radio manufacture in January, 1947, was limited to certain occupations in five centres which employed about half of the estimated total of 143,000 workers in the industry in the United States. Class C assemblers accounted for one in every five workers in the industry, which is operated by mass production methods, and the average straight-time hourly rates in this particular occupation ranged from $0·84 to $1·03 for men and from $0·84 to $0·95 for women. The highest rates in the industry were those of tool and die makers, ranging from $1·61 to $1·83.

Progress Toward Export Targets

Though electrical exports during the fourth quarter of 1947 were not quite so high as in the third quarter they are well on their way to reaching the targets set for mid-1948. The position regarding individual items is as follows:

MONTHLY RATES OF EXPORT (MILLIONS OF £)

	4th Quarter 1947	3rd Quarter 1947	4th Quarter 1946	Target Mid-1948
Wires and cables ..	1·04	1·07	0·90	0·90
Wireless apparatus ..	0·83	0·79	0·93	1·00
Telephone and telegraph apparatus	0·57	0·56	0·46	0·60
Other electrical goods ..	1·47	1·52	1·55	1·70
Electrical machinery ..	1·92	1·94	1·63	1·92
Total	5·83	5·88	5·47	6·12

Fuel Economy Displays

The Finchley Borough Electricity Department has arranged effective window displays at its two electricity showrooms urging electricity consumers to restrict the use of appliances during the peak periods. It is pointed out that factories in Finchley have reduced their daytime load, and that it depends on domestic consumers as to whether load shedding will be necessary.

New Scottish Factory

The first tenant to occupy the 30,000 sq ft factory on the new Kilwinning (Ayrshire) industrial estate will be Baeltz Equipment, a firm from the Midlands which has taken over half of the building for the manufacture of electrical equipment.

Review of German Science

The Foreign Office has announced the publication of the first volumes of the "FIAT Review of German Science," compiled by German experts under the direction of the British, American and French Field Intelligence Agencies (Technical). The Review is written in German, and covers fundamental research in pure science in Germany between 1939 and 1946. The British share of about 250 sets of the first printing (to be completed within six months) will be issued to Governmental and other bodies within the Commonwealth, to universities and medical schools and to the libraries of certain societies. A German edition will later be obtainable through normal trade channels. Volumes will be sold only in sets under each of the six subject headings of physics, chemistry, mathematics, medicine, biology and geophysics.

Generating Sets for War Office

Associated British Oil Engines, Ltd., has received from the Ministry of Supply an order valued at over £100,000 for seventeen diesel electric generating sets. The order has been placed on behalf of the War Office. The plant comprises nine Petter "SS6" six-cylinder superscavenge two-stroke oil engines direct-coupled to 300-kW, 415-V, 3-phase, 50-cycle Brush alternators, four "SS3" three-cylinder engines coupled to 150-kW alternators, and four "SS2" two-cylinder engines driving 100-kW Brush alternators.

Pakistan Import Control

Among items included in an open general licence issued by the Pakistan Government applicable to the United Kingdom and sterling Empire countries (except the Union of South Africa) are the following:—Boilers, diesel engines, motors and generators, electrically-operated machinery, conduit and accessories, control gear, transmission gear, wires and cables.

Newfoundland Import Duties Amended

As a result of amendment of Newfoundland import duties under the Geneva Agreement, both the intermediate and preferential duties on accumulators and batteries are now at the uniform rate of 20 per cent.

Trade with South Africa

Our Cape Town correspondent reports that a South African branch of the Belgian electrical engineering organization, Belgelectro-Export, has been opened in Johannesburg, and although at the moment there does not seem to be any plan to open branch factories in the Union, there is to be a determined effort to sell Belgian electrical goods there.

The Swedish ASEA company is opening a factory in South Africa to make transformers, cables, and other electrical equipment. It is planned to obtain raw materials from the company's Swedish iron and steel works, but where possible South African materials will be used.

Price Labels in Australia

The Assistant Prices Commissioner of Australia has made an Order requiring anyone selling certain goods (other than by auction) to

display a label giving the selling price. Articles covered are domestic electric cooking and heating appliances, radio receivers and refrigerators, the prices of which are fixed by the National Security (Prices) Regulation. Furthermore, advertisements of any of these goods must include the selling price.

Dissolution of Partnership

Messrs. A. Lambert, A. Fox and V. C. Bottomley, carrying on business as electrical engineers at 40, Sunbridge Road, Bradford, under the style of Lambert & Fox, have dissolved partnership by mutual consent.

Thorn-Sylvania Agreement

An agreement has been signed between Thorn Electrical Industries, Ltd., and Sylvania Electric Products, Inc., of New York, providing for the interchange of technical information in the manufacture of electric lamps and lighting equipment. Sylvania, producers of fluorescent lighting, will make their patents and manufacturing processes available to the British company, and technical personnel will be interchanged.

Dutch Electrical Exports

Exports of Dutch electrical goods in 1947, valued at 154 million Dutch florins, were well above comparative pre-war figures. Of total exports, radio sets accounted for 83·6 million florins and lamps for 37·8 million. Before the war electrical exports amounted to about 8 per cent of Holland's total exports, a figure which increased to 20 per cent in 1947.

Lamp Component Factory

A site has been obtained at Harworth, Yorks, by the British Thomson-Houston Co., Ltd., for the erection of a factory for the manufacture of electric lamp parts.

Trade Publications

Edison Swan Electric Co., Ltd., 155, Charing Cross Road, London, W.C.2.—Leaflet (No. R.1303) with dimensional drawings of multiple metal-to-glass terminal seals for hermetically closed and miniature radio components.

British Thomson-Houston Co., Ltd., Rugby, Warwicks.—Technical folder (No. 5859-11) on multi-purpose germanium crystal rectifier for communication equipment.

The Plessey Co., Ltd., Ilford, Essex.—Technical leaflet describing television receiver components and folder (No. 155) illustrating centrifugal switches for starting small single-phase motors.

Clifton Aircraft, Ltd., Lytham, Lancs.—Leaflet illustrating switched fuse units for domestic distribution systems.

Standard Telephones & Cables, Ltd., Connaught House, Aldwych, London, W.C.2.—Two technical brochures; (SRG1) describing characteristics and applications of selenium rectifiers and (TD8) installation and operation of pneumatic ticket tube systems for telephone exchanges.

Hi-Craft Electrical Products, Ltd., 25, Manchester Square, London, W.1.—Revised issues of three priced leaflets illustrating domestic switches, plugs and sockets.

Varley Dry Accumulators, Ltd., By-Pass Road, Barking, Essex.—Technical brochure describing dry accumulators.

Brush Electrical Engineering Co., Ltd., Loughborough.—Spare parts catalogue for the "Pony" battery electric vehicle (price 5s.).

London Fan & Motor Co., Ltd., 91a, Burghley Road, Tufnell Park, London, N.W.5.—Priced list of industrial ventilating fans and accessories.

Scottish Radio Convention

The Radio Industries Club of Scotland, in conjunction with the Scottish Music Merchants Association, has arranged to hold this year's Scottish Convention at the Atholl Palace Hotel, Pitlochry, Perthshire, from 1st to 4th June, under the presidency of Mr. P. Mackenzie, Scottish representative of the Marconiphone Co., Ltd.

Trade Announcements

E. K. Cole, Ltd., has appointed Mr. E. G. C. Garner, formerly in charge of the order department at Southend-on-Sea, as radio representative for the East Lancashire area. Mr. Garner succeeds Mr. A. G. Brenwald, who has been appointed to assist in the general administration of the Sales Department at Southend.

Reynolds & Bradwell, Ltd., have moved to 35-36, Carver Street, Birmingham, 1. The telephone numbers are unaltered.

Linolite, Ltd., has appointed Mr. W. Fraser, 132, Renfrew Street, Glasgow, C.2 (tel.: Douglas 6955) as its agent for Scotland.

Change of Name

Ergon Electro Motors, Ltd., have changed their name to H. J. Mugdan, Ltd.

Export Inquiries

WE have received the undermentioned inquiries from firms and individuals overseas who wish to secure agencies for British electrical equipment and appliances or to import them into their territories. We shall be glad to pass on to them replies received from readers, which should be addressed to the Editors, quoting the number given in parentheses. We cannot vouch for the standing of inquirers and manufacturers replying to them will no doubt require the usual references:—

Siam.—A Bangkok firm wishes to obtain catalogues and price-lists from British manufacturers of electrical domestic appliances and materials with a view to importing this equipment into Siam. (X.197.)

Temperature Control

Development of "Servo-Technique"

INTENDED primarily for installation and maintenance engineers and users who are not usually concerned with the actual design of temperature control equipment, a paper prepared by MR. F. E. BUTCHER (Electro Methods, Ltd.), on the critical control of temperature in domestic and industrial processes was read last week before the Association of Supervising Electrical Engineers.

Outlining the principles of operation of present day control methods, Mr. Butcher expressed the opinion that owing to knowledge gained during the war a new art was developing which could be called "servo-technique" and would have a profound influence on future control problems.

Magnetic Amplifier

Although the use of pneumatic and hydraulic amplifiers had been known for some time, the advent of the electron tube had facilitated considerable advances in the conversion of thermocouple e.m.f. to an almost lagless control. Nevertheless the author considered that the electronic amplifier was due to be superseded by the magnetic amplifier, which was a development of the saturable reactor and would perform functions not easily carried out by the electronic amplifier, with greater reliability.

This device could be employed as a d.c. amplifier or a d.c./a.c. invertor amplifier and would accept and mix a number of d.c. signals completely isolated from one another and the output circuit. A small generator of the type fitted to the "V2" weapon was shown which had its frequency controlled very accurately by means of a magnetic amplifier. Mr. Butcher did not wish to over-emphasize the device, but he was of the opinion that engineers should keep in close touch so that those in this country might retain their lead in magnetic amplifier technique.

The "Mess" Motor

Another accessory which was of great use in control circuits was the "mess" motor (an abbreviation of the German *messung*, meaning measurement), which, so far as was possible, eliminated factors likely to affect the linearity of the voltage speed-curve. The resulting accuracy was of such an order that these motors could be used to integrate minute voltages on a time basis. By utilizing a suitable transducer for converting temperature or temperature difference into a voltage signal the "mess" motor could integrate over a time and apply the result, instead of relying upon instantaneous readings with the smaller available power. A demonstration of a "mess" motor was given running directly off a photo-cell and a thermocouple.

In conclusion the author said that the provision of sensitive error or temperature detectors in the correct place, high and rapid amplification applied to correct the error with the integral and derivative of the error applied to the controller in suitable proportion and a reduction so far as was possible of all lags, together with reliability, would give the desired result in most cases.

New Electricity Orders

Obligations, Prices and Pensions

UNDER the powers conferred on him by the Defence (General) Regulations, the Minister of Fuel and Power has made the Electricity Supply (Relaxation of Obligations) Order, 1948 (Statutory Instruments, 1948, No. 223, H.M. Stationery Office, 1d.).

This relieves electricity undertakings from obligations imposed upon them by the Electric Lighting (Clauses) Act, 1899, and they are now not compelled to give or continue a supply to the owner or occupier of premises not already connected to the mains before the commencement of the Order (13th February); to lay lines to supply more power to any premises; or to supply or fix any meter otherwise than in replacement of another meter of the same capacity.

Another Order—the Electricity (Price Control) Order, 1948 (S.I. 1948 No. 224, Stationery Office, 1d.) prohibits undertakings from reducing charges without a "licence" from the Minister and from giving discounts and rebates to consumers, except discounts for prompt payment of not more than 5 per cent or at any greater rate which has been continuously allowed for not less than three years before the date of the Order.

The Minister has also made the Electricity (Pension Scheme) Regulations, 1948 (S.I. 1948 No. 226) under Section 54 of the Electricity Act, 1947. These regulations authorize any Electricity Board to establish or participate in any scheme approved by the Minister (or the Secretary of State for Scotland in the case of the North of Scotland Hydro-Electric Board) for providing pensions for their employees or for the employees of the Board's Consultative Council.

Overseas Trade Statistics

Accuracy Depends on Individual Exporters

By John C. Hancock

THE *Electrical Review* regularly publishes the overseas trade returns each month. Not all electrical traders and manufacturers who study these statistics know how they are obtained; nor perhaps do they realize that these official figures are compiled from information which they, as exporters, are required by law to render every time they ship goods abroad.

The statistics, to be of any value, must be highly accurate, since they are used as a basis for bargaining and negotiating trade and currency agreements with other countries. In view of the great emphasis which is placed on attaining our appointed export targets, we should never be quite certain whether we had reached them or not if the statistics of overseas trade were found to be unreliable or did not reflect accurately the true state of the nation's economic situation.

The figures appearing in the *Electrical Review* and other journals, are extracted from the monthly " Accounts Relating to the Trade and Navigation of the United Kingdom," published by H.M. Stationery Office. For a small fee any individual or trade organization can obtain a " breakdown " of the figures contained in this publication. Should the exporter wish to know the value and quantity of, say, house service meters, prepayment type, complete, exported over a given period to particular countries the Statistical Office of H.M. Customs and Excise would be able to tell him. As such information is supplied by each individual exporter, or his shipping agent, it follows that it is in the exporter's own interest to see that the information rendered by him contributes to the general accuracy of the official figures.

Lodging of Specifications

A Customs specification covering every consignment of goods leaving the United Kingdom has to be presented to H.M. Customs and Excise. The exporter is required, under the Customs and Inland Revenue Act, 1881, either personally or through an agent, to lodge such a specification on the appropriate form within six days of the final clearance outward of the exporting ship. Specifications covering goods exported by air must be lodged before loading. Goods subject to any licensing restrictions and goods exported under drawback (that is, when a refund of Customs duty is being claimed) have to be " pre-entered " on a shipping bill, which is, in effect, another type of specification. Eventually, each shipping bill and specification lodged at the various docks and airports finds its way to the Statistical Office where the information is tabulated and classified.

Inaccurate Returns

The fact that the Statistical Office has to refer back to the trading community a steady average of about 2,000 essential queries a month, either because the forms are not filled in correctly, or because they lack some essential information, seems to indicate that many exporters are not aware for what purpose these specifications are required. Or, perhaps, many exporters tend to underrate the importance of giving absolutely correct information—or even of lodging a specification at all. If every exporter took this view it follows that the trade returns would be misleading.

A great many exporters have probably never had occasion to refer to the Customs and Inland Revenue Act, 1881. The official " Export List " which " sets out the classified descriptions under which goods produced or manufactured in the United Kingdom are to be entered when exported " makes no mention of this Act at all; nor, surprisingly, does the " Export List " indicate *why* exporters are required by law to " enter upon the appropriate forms full particulars of the goods exported by them in accordance with the official classification." Perhaps a short statement in the " Export List " explaining the purpose of these specifications and stressing the importance of accuracy in their compilation would have the effect of reducing the number of queries dealt with by the Statistical Office.

As already mentioned, sometimes no specification at all is lodged. On the other hand, two entries are not infrequently rendered covering the same consignment. One perhaps is lodged by the exporter and one by his agent; or a manufacturer delivering goods f.o.b. a certain port might in all

good faith lodge a specification when the responsibility for this rested with his customer, namely, the "real" exporter of the goods. In some ports the person who pays the freight is responsible for making the entry, while at others the f.o.b. supplier is liable. In Liverpool, for instance, the person who delivers f.o.b. is responsible for making the entry, while in the Port of London this obligation rests with the person who pays the sea freight.

Accounting for All Packages

The information required of the exporter has been reduced to a minimum, but that does not make the specification "just another form" to be filled up, because all the information is needed for a specific purpose. The shipping marks and numbers and descriptions of packages are called for because it is from these details that the "Customs" identify a particular consignment appearing on the ship's manifest. Care should be taken to include all the packages appearing on the corresponding bill of lading, otherwise an official reminder will be sent to the effect that no specification appears to have been received covering such and such a package, and drawing the exporter's attention to the fact that he is liable to a penalty not exceeding £5 if he fails to deliver the required document.

Goods have to be "described and classified in accordance with the headings indicated in the official 'Export List.'" In addition, the trade names or descriptions under which the goods are generally known should also be given. Thus "electric cable" should be described as such and classified according to whether it is "telegraph or telephone" or "other descriptions," while the type of insulation has also to be given. If the cable happens to be paper insulated this should be qualified by the statement *whether or not* it is for telegraph or telephone. The final description would read thus: "Electric cable—paper insulated, not for telegraph or telephone," together with details of the net weight. In order to estimate the volume of exports certain units of quantity have to be given, which vary with the class of goods exported. Dry batteries, for instance, have to be declared in terms of number of cells and the net weight, while electric cable is measured in so many tons.

In all instances the f.o.b. value to the nearest pound must be given and the "Customs" have more than once drawn attention to the fact that many exporters make the value on their specifications agree with the value entered on the Exchange Control "CD3" form. Since the Exchange Control figure generally represents a c.i.f. value the two figures clearly should not agree.

The nationality of the carrying steamer needs also to be shown on the specification. This information is required so that the amount of "invisible" exports earned by the country in the way of freight charges can be estimated when the goods are carried in British registered vessels. The port at which the goods are unshipped need not necessarily indicate the country of final destination, as, for instance, goods may be off-loaded at Haifa in Palestine, but destined for Iraq or Iran.

The "Customs" cannot be expected to check every item on a specification so a great deal is taken on trust by the simple declaration required of the exporter that "all the particulars set forth are correctly stated." Justly proud of the fact that any statistics supplied by them are invariably taken "as read" the "Customs" are very jealous of their reputation for accuracy—but their accuracy, as this article makes clear, depends in the first instance on the co-operation of every exporter and shipping agent.

Ripple Control

Register of Installations

IT was about a year ago that the Ripple Control Technical Committee was formed by certain manufacturers with the objects of facilitating technical co-operation between makers of the equipment and of encouraging the development of this control principle. During the past twelve months a register has been compiled of ripple installations, including all those at present existing in the United Kingdom, which lists the operating authority, area of supply network that is controlled, certain technical details of the ripple injection equipment and receiving relays.

The register is to be added to from time to time and is intended to be "freely available" for inspection by users and prospective users of these systems of control. The chief object is to furnish authoritative information for users and manufacturers alike so that due provision may be made when necessary in the case of new installations to ensure that "spillover" signals will not be likely to cause mal-operation of any existing equipments.

Copies of the register are to be kept in London, Liverpool and Manchester and can be inspected by application to the hon. secretary of the Committee, Mr. R. M. A. Smith, "Whitegates," Wood Lane, Timperley, Altrincham, Cheshire.

ELECTRICITY SUPPLY

Royal Visit to Kingston. Rebates and Rate Aid.

Blackburn.—POWER STATION EXTENSIONS.—The electrical engineer (Mr. R. H. Harral) has reported upon a meeting with representatives of the Central Electricity Board to discuss the effect of the cancellation of the 1941 extension at the Whitebirk generating station. He said he had now been notified that the building, engineering and civil engineering work, the foundations for the fourth cooling tower and circulating water mains in connection with the 1951 programme are to proceed. One of the low-pressure sets will be taken out of commission on 1st April next and the remaining sets will continue to operate until 1st April, 1949, subject to satisfactory technical conditions. The Town Council gave approval to the report and an amended estimate to cover stage three of the extensions.

COMMERCIAL CHARGES.—No alteration is to be made by the Corporation in computing electricity charges for separate premises. A request was received from the Blackburn Chamber of Commerce that charges for separate premises of an individual firm should be computed together.

ELECTRICITY FOR NEW ESTATE.—The Corporation has approved a scheme for supplying electricity to houses being built on the new Mellor housing estate at a cost of £2,957.

Birkenhead.—H.V. CABLE.—An 11-kV underground feeder is to be laid in connection with the augmentation of supplies to South-East Wirral. The estimated cost is £2,585.

SUPPLY TO BAKERY.—The Electricity Committee has approved an application for a supply to a new bakery (approximate load 450 kW). A substation is to be constructed on the premises to provide for the bakery requirements and also a.c. supplies in the area as the change-over takes place. The estimated cost of the switchgear, transformers and feeder is £6,770.

Birmingham.—EXTENSIONS AT NECHELLS.—The Corporation has been directed by the Central Electricity Board to proceed with the second half of the new power station at Nechells by the installation of two 50,000-kW sets and a 2,500-kW auxiliary set, together with six 230,000 lb per hr boiler units and a 4 million gal. per hr cooling tower. One turbo-alternator set, three boilers and the cooling tower are to be ready for commercial operation in July, 1951, and the remainder of the plant in July, 1952. The estimated capital cost is £5,356,680.

Canterbury.—REVISED CHARGES.—Faced with an estimated loss of some £9,500 on the current year's working of the electricity undertaking the City Council has decided to revise the charges as from the March meter readings. About £4,000 will be saved by the discontinuance of discounts, and other revisions include the raising of the " unit " charges under the domestic and business two-part tariffs from 1¼d. and ⅝d. to 1½d. and ¾d. (the lower rate in the case of the domestic tariff applies where a 2-kW cooker or immersion heater, or 1½ gal water heater are used). The minimum standing charge under both tariffs will be £2 per annum; no meter rents will be charged.

Dewsbury.—DISTRIBUTION IMPROVEMENTS.—The Corporation has approved proposals submitted by the borough electrical engineer to improve the distribution system, particularly in the Leeds Road, Shaw Cross, Earlsheaton and Thornhill Lees districts. The estimated expenditure involved amounts to £17,798, including the cost of four new substations.

Gloucestershire.—PROGRESS OF RURAL ELECTRIFICATION.—In 1944 a comprehensive scheme was prepared for the rural electrification of the whole of the West Gloucestershire Power Company's area which at that time was estimated to involve a capital expenditure of £1,600,000. An *ad hoc* committee set up with the Gloucestershire War Agricultural Executive Committee, the National Farmers' Union and other representative associations, made recommendations regarding work to be commenced in 1945 and subsequent years. The area of supply was, for the purposes of the scheme, divided into 24 large agricultural areas, and up-to-date schemes have been completed, or are in progress, for such diverse areas as Charfield and Bibstone, Coaley, Churcham and Minsterworth, Marshfield and Cold Aston, and the rural districts of Monmouth and Pontypool. A further step in the development of this electrification has been the recent authorization by the company of the initiation of a scheme, estimated to cost £55,000, to to supply 93 farms and 341 other premises, including the villages and hamlets of Breadstone, Berkeley Heath, Heathfield, Newport, Woodford, Ham, Stone and Hill. The general manager (Mr. Gordon D. Johnstone) informs us that the schemes now authorized to be put in hand forthwith involve ultimately a capital expenditure of £100,000, this work being in addition to an overall expenditure of £266,000 incurred in 1947.

Hull.—DECISION TO RAISE CHARGES.—After the defeat (by 34 votes to 41) of an amendment that there should be no alteration and any loss before the undertaking was taken over met out of reserve, the City Council approved a recommendation to increase electricity charges by 12½ per cent as from 1st February. The higher rate will apply to all electricity consumed in the present quarter, and Councillor K. Turner argued that this was morally wrong. Councillor Buckle said that the decision to increase tariffs was in accordance with economic facts, and

Alderman I. Robinson thought it was the only practical way of dealing with the situation. They had refused to subsidize the rates, although many would have taken from the undertaking so much that it would have had no reserves, and all the time the community had had the benefit of cheap electricity.

Kingston-on-Thames.—KING TO OPEN POWER STATION.—The King, accompanied by the Queen, will open the new power station at Kingston-on-Thames on 27th October.

Morecambe and Heysham.—RING MAIN.—To provide an adequate supply of electricity for industrial purposes near White Lund Hill, ring main units are to be installed at a cost of £2,559.

North-Eastern Area.—CHAIRMAN OUTLINES ARRANGEMENTS. — Local authorities recently attended a conference at Newcastle-on-Tyne called by the chairman of the North-Eastern Electricity Board, Mr. H. H. Mullens, to discuss the nationalization of the electricity industry and the best method of dealing with problems which might arise, Mr. Mullens stated that the North-Eastern Area would be divided into about six sub-areas each under a sub-area manager and each sub-area would be further divided into districts to give scope to local knowledge.

Mr. Mullens also dealt with the services which the electricity department of a local council carried out for other departments of the council and stated that the Area Board did not want to embarrass local authorities by the immediate withdrawal of these services. Suitable arrangements would be made to cover matters of this kind. Under the Act, local councils would cease to operate as electricity undertakers on vesting date, and it would be therefore necessary for the Area Board to appoint a chief executive officer who would act as temporary controller under the directions of the Area Board.

North-Western Area.—DEARER ELECTRICITY.—Mr. George Gibson, chairman of the North-Western Electricity Board, told representatives of forty cities and towns in the Manchester, Bolton, Stockport and Oldham areas at Manchester that the cost of electricity would be raised before 1st April by a fraction of a penny per kWh.

Northern Ireland.—ELECTRICITY BILL.—The Northern Ireland Electricity (Supply) Bill, of which the text has just been issued, follows the proposals embodied in the White Paper of June last. These include the transfer of all Government-owned generating stations to the Electricity Board, Belfast, which will be responsible for all supply outside the city of Belfast, and the city of Londonderry. These two undertakings will be carried on as heretofore, but co-ordinated in the main scheme. Co-ordination between these three authorities in Northern Ireland and the Electricity Supply Board of Eire will be entrusted to a committee. The Bill provides for the discontinuance of the guarantee system for a number of years. Last summer a White Paper on this subject was approved by the Northern Commons, but there is some opposition on behalf of certain rural undertakings to the exclusion of Belfast from the scope of the Board.

West Hartlepool.—REBATE EXPLAINED.—Alderman M. Bloom, who was chairman of the Corporation Electricity Committee when it agreed last April to return £25,000 to consumers in the form of a rebate, has commented on the Minister of Fuel's statement in the House of Commons regarding excessive rebates. Alderman Bloom pointed out that at West Hartlepool the rebate was granted from a rebate allowed to the Corporation from the bulk suppliers of electricity. He pointed out that the Corporation had for years been paying too much to the bulk suppliers, and when the suppliers made a rebate, it was passed on to the consumers, as it had been paid by them in the first place. Just before Christmas, West Hartlepool consumers were allowed rebates of one-third on electricity accounts.

RELIEF OF RATES.—The Town Council has decided to take £11,500 from the profits of the electricity undertaking for the relief of the general rates. Alderman M. Walton (chairman, Finance Committee) said he did not think that the Minister of Fuel's recent statement about councils granting large rebates to consumers in view of pending nationalization applied to surpluses.

West Riding.—REFUNDS TO UNDERTAKINGS.—Reference has been made to the refunds to a number of undertakings in the West Riding following the Ilkley Urban District Council's test case on transmission line costs. Altogether twenty-three areas will share £193,307 to be repaid by the Yorkshire Electric Power Co. on electricity accounts for the years 1938-46. The consent of the Minister of Fuel and Power has been given for the money to be paid over. The individual amounts of the refund are as follows:—Barnoldswick, £7,527; Barnsley, £6,221; Batley, £17,936; Bingley, £14,164; Bradford, £2,477; Brighouse, £8,026; Colne Valley, £2,228; Castleford, £1,290; Dewsbury, £19,117; Dearne District Electricity Board, £4,122; Elland, £8,621; Earby, £1,907; Gainsborough, £13,807; Heckmondwike, £6,273; Holmsfirth, £12,423; Ilkley, £9,099; Mexborough, £5,792; Mirfield, £4,212; Normanton, £2,019; Pudsey, £8,323; Skipton, £7,586; Spenborough, £14,886; and Todmorden, £15,251.

Generation of Electricity in January

RETURNS rendered to the Electricity Commissioners show that 4,541 million kWh was generated in January as compared with the revised figure of 4,671 million kWh for January, 1947—a decrease of 2·8 per cent. Energy sent out amounted to 4,295 million kWh (against 4,423 million)—a decrease of 2·9 per cent.

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

Yorkshire Electric Power Co.—In his address at the company's annual meeting on Monday last, Sir Geoffrey Ellis (chairman) said that in the past three years the output of their stations had been 860 million, 1,098 million and 1,176 million kWh respectively. Their new station at Mexborough, which commenced operations three years ago, had met with considerable difficulty from frequent fouling by several local sewage effluents into the river. Nevertheless the station efficiency had steadily progressed and the cost of operation was less than that of any British station using normal fuel, of which information had been published. Changes in Government policy would prolong the time when the extensions at Thornhill would come into service. After criticizing the nationalization of the industry from several points of view, including the compensation terms, which took no account of goodwill, he concluded by saying: "Our supplanters have grabbed an undertaking efficiently run, well established and rapidly growing in prosperity, much of whose property they will not pay for. We have made it. May they not mar it."

E. K. Cole, Ltd.—Further expansion in the past year resulting in more than double the 1946 export turnover was reported by Mr. Eric K. Cole (chairman and managing director) in his statement submitted at the annual meeting. He said that the company's production units had now been stabilized at Southend, Glasgow, Preston and Malmesbury. In addition to retaining the factory they were now operating at Glasgow, an agreement had been reached with Scottish Industrial Estates, Ltd., to build a new works. After referring to progress in the radio, lighting and plastics divisions the chairman said that in the special products division production of Thermovent heaters had been considerably curtailed by Government quota in so far as the domestic and industrial market was concerned, but an increasing demand was being experienced for installations in ships. In view of the continued expansion of the various departments additional permanent capital was required and the necessary application had been made to the Capital Issues Committee.

English Electric Co., Ltd.—The full accounts show a trading profit for 1947 of £681,504, as compared with £567,363 for the preceding year, plus net dividends from D. Napier & Son, Ltd., and Marconi's Wireless Telegraph Co., Ltd., making £783,671. After meeting debenture interest, depreciation, directors' remuneration and trustees' fees, there is a net profit of £491,362 (against £492,775), which with £123,673 brought in, makes £615,035 available. As already announced, the final ordinary dividend is 6 per cent, making 10 per cent for the year (unchanged), and the balance carried forward is £131,082.

The Electrical & Industrial Investment Co., Ltd., reports a net profit for 1947 of £35,763, as compared with £27,284 for 1946. The dividend on the deferred ordinary stock is 20 per cent (against 12 per cent), and £17,613 is transferred to undivided profits account (against £11,310 brought in).

The Bylock Electric, Ltd., which was made public in June last, reports net profits for the year to 31st July of £21,925. The ordinary dividend for the year is 300 per cent, as forecast in the prospectus, and £7,011 is carried forward.

Taylor Tunnicliff (Electrical Industries), Ltd., reports an increase in net profit from £47,378 for 1946 to £83,269 last year. It is proposed to pay a dividend of 15 per cent (against 12½ per cent).

Metal Industries, Ltd., is paying an interim dividend of 3 per cent, the same as last year but on larger capital.

Isle of Thanet Electric Supply Co., Ltd.—The directors have decided to pay, on 28th February, the dividend on the 6 per cent cumulative participating preference stock, less tax, for the period 1st April, 1945, to 31st December, 1947.

Thos. W. Ward, Ltd., have declared an interim dividend of 5 per cent, against 3¾ per cent last year.

Rd. Johnson, Clapham & Morris, Ltd., are paying an unchanged interim dividend of 5 per cent.

Clarke, Chapman & Co., Ltd., out of a net profit of £107,847 (against £100,202) are maintaining the dividend for the year at 15 per cent.

The City of London Electric Lighting Co., Ltd., proposes to pay a final dividend of 4½ per cent, making 7 per cent for the year (same).

Electricity Companies' Securities

The following compensation values have been agreed with the Minister of Fuel and Power:—

Northmet Power Co.—5 per cent mortgages, £107 3s. 4d.; 4 per cent debenture stock, £102 10s.; 3½ per cent debenture stock, £100 10s.; 6 per cent preference stock (£1), £1 11s. 7d.; 4 per cent preference stock (£1), £1 2s. 5d.; ordinary stock (£1). £2 8s. 2d.

North Metropolitan Power Station Co., Ltd.—3½ per cent second mortgage debenture stock, 1963, £102 10s.; Series "B," 1965, £101 10s.; 3¼ per cent second mortgage debenture stock, £101.

New Companies

G. Dodd, Ltd.—Registered 5th February. Capital £10,000. Electrical engineers and general electrical installation contractors, etc. Directors: G. F. Dodd (permanent) and Eileen M. Dodd. Regd. office: 568, Mansfield Road, Sherwood, Nottingham.

W. J. Overs, Ltd.—Registered 3rd February. Capital, £1,000. To acquire the business of electrical engineers carried on by W. J. Overs at Lake, I.W. Directors: W. J. Overs and E. E. Overs. Regd. office: 47, Lake Green Road, Lake, I.W.

Hamgear, Ltd.—Registered 7th February. Capital, £300. Manufacturers and dealers in radio, electronic, electro-mechanical and other electrical apparatus, etc. Directors: J. Stone, D. May and Mrs. J. M. May. Regd. office: Cleeve, Buckeridge Road, Teignmouth.

R. M. Johnstone & Co., Ltd.—Registered 6th February. Capital, £500. Manufacturers, wholesalers and distributors of electrical appliances and equipment, including radio, etc. Permanent directors: R. M. Johnstone and Peggy Johnstone. Regd. office: 2, Heath Street, N.W.3.

Electrospares, Ltd.—Registered 4th February. Capital, £100. General electrical engineers and contractors, manufacturers and repairers of, and dealers in, dynamos, motors and irons, etc. Directors: J. H. Weinberger and P. M. Sebestyen. Regd. office: 19-23, Fitzroy Street, W.1.

Bankruptcies

J. H. Christopher, 135, Balkwell Avenue, North Shields, lately carrying on business at 54, Saville Street and Suez Street, North Shields, electrical engineer.—Last day for receiving proofs for dividend 21st February. Trustee, Mr. A. K. Ferguson, Gibb Chambers, Westgate Road, Newcastle-on-Tyne, Official Receiver.

F. O. Tosswill, lately carrying on business at 15, Portsmouth Road, Guildford, electrical engineer.—Bankrupt discharged subject to his consenting to judgment being entered against him for the sum of £77 2s. 2d. Judgment satisfied before signing of order.

L. C. Rowse, formerly carrying on business at 60, Lower Market Street, Penryn, Cornwall, radio and electrical engineer.—Last day for receiving proofs for dividend 1st March. Trustee, Mr. A. H. Ward, 12, Princes Street, Truro, Official Receiver.

Liquidations

The Lancaster Electrical Company (Enfield), Ltd.—The first meetings of creditors and shareholders were held at the offices of the Board of Trade, Columbia House, Aldwych, London, W.C.2, on 12th February. No resolutions were passed and the matter was left in the hands of the Official Receiver as liquidator of the company.

Herne Bay Relay Services, Ltd., Faversham Relay Service, Ltd., and **Sittingbourne Relay Service, Ltd.**—Winding up for reconstruction purposes. Liquidator, Mr. N. E. Pawsey, 93, Station Road, Clacton-on-Sea. Particulars of claims to the liquidator by 31st March. This notice is purely formal ; all creditors have been or will be paid in full.

J. Jones Electrical Installations, Ltd.—Meeting of members at Shillingford Court Bungalow, Shillingford, Oxford, on 6th March to receive an account of the winding-up by the liquidator, Mr. S. G. Hunt.

Union Electrical Co., Ltd.—Resolution for voluntary liquidation passed on 9th February.

Trade Marks

APPLICATION has been made for the registration of the following trade marks. Objections may be entered within a month from 11th February:—

MAGNATEX, MAGNAVAC and MAGNA. Nos. 651,437, 651,441 and 651,443 respectively, Class 7. Electric motors (other than motors for land vehicles) and motors operated by air pressure, etc., and parts included in Class 7 of all such goods.—Magnatex, Ltd., Bath Road, Harlington, Middlesex.

ARENCO. No. 647,498, Class 9. Electrical and mathematical apparatus and instruments, all included in Class 9, etc.—Arenco Aktiebolag, Stockholm. Address for service: Boult, Wade & Tennant, 112, Hatton Garden, E.C.1.

ELLA. No. 653,154, Class 9. Electrical fittings included in Class 9.—Lionel Robinson & Co., Ltd., 3, Staple Inn, W.C.1.

CROWTOWN. No. 653,473, Class 9. Electrical apparatus and instruments included in Class 9, etc.—V. T. Townsend and D. Crowther, trading as Townsend & Crowther, Crowtown Works, Cambridge Road, Walsworth, Hitchin.

TRIX. No. 652,363, Class 10. Electrically-operated instruments and apparatus for surgical medical, dental and veterinary purposes, but not including surgical cutlery.—Trix Electrical Co., Ltd., 1-5, Maple Place, Tottenham Court Road, W.1.

WINDAK. No. 655,321, Class 10. Electrically heated blankets.—Baxter, Woodhouse & Taylor, Ltd., Queen's Buildings, St. Peter's Square, Stockport.

ARISTOCRAT. No. 646,245, Class 11. Electric fires for domestic use.—W. McLeman and H. W. Pinchin, trading as M.P. Stainless Products, 1, Fleet Street, Birmingham.

NORIC. No. 655,395, Class 11. Electric lighting fittings and pendant, table and standard lamps.—J. H. Norris, trading as John H. Norris & Co., 141, Chorley Old Road, Bolton.

OMALITE. No. 655,839, Class 11. Electric lamps.—Office Machinery, Ltd., 11 and 11a, Avenue Chambers, Southampton Row, W.C.1.

STOCKS AND SHARES

STOCK Exchange markets have passed through a turbulent time since a week ago. The Chancellor of the Exchequer has shown clearly the crisis that the country is facing. As a direct consequence, public confidence in the outlook for stocks and shares, particularly those of the industrial classes, suffered a sharp shock. Severe falls in United States markets for commodities and securities added further fuel to the anxieties of investors.

The result was seen in a stream of substantial selling and a general fall in prices of industrials. On the other hand, British Government and similar gilt-edged stocks have been advancing in price. Money which normally would have gone into industrials has been seeking gilt-edged shelter. Few of the industrial sections escaped the influence of the semi-slump which overtook prices last week. No great improvement is expected until after the forthcoming Budget has been opened, but bargain-hunters were in evidence at the end of last week, and partial recovery lifted prices well above their recent lowest levels.

Gilt-edged v. Industrials

Even before the latest Government reviews of the state of the country, any easy optimism about forthcoming company dividends had been chilled by the White Paper dealing with incomes and wages. A phrase from this Paper regarded as having practical application to investments was the pronouncement that there was little present justification for any rise in incomes from "profits, rents or other like sources." From this was drawn the first inference that profits and dividends might become involved in the Government's attempt to control wages.

Prices, Profits and Dividends

Not until the provisions of the Budget are made known will it be possible to assess the probable effect of the Government's present move to cut prices and profits in order to combat the vicious spiral of inflation. Negotiations between the Chancellor of the Exchequer, the F.B.I. and trade organizations can hardly fail to affect earnings. People who have bought shares in the expectation of receiving increased dividends and, therefore, of seeing appreciation in price, are liable to disappointment. The majority of companies whose shares are quoted in our monthly lists, occupy, however, positions of such financial strength as to make it unlikely that dividend cuts need be anticipated although bonuses may be dropped.

The Week's Changes

Of the shares mentioned in the preceding paragraph, the past week's depreciation amounts to 5s. 6d. in the case of G.E.C., 4s. in Johnson & Phillips, 3s. in Automatic Telephone, and 2s. 6d. in Crompton Parkinsons. Relapses of between 4s. and 5s. have been suffered during the week by Telegraph Constructions, now 47s., Ever Ready 37s., Deccas 31s. 3d., and De La Rue 42s. Losses of about half-a-crown are common to Crabtrees 40s. 9d., E. K. Coles 17s. 9d., British Insulated 33s. 9d., Reyrolle 63s. 9d., and Revo 53s. 9d. Among the biggest falls were those of 13s. 9d. in Tube Investments, to 6 $\frac{3}{16}$, and 12s. 6d. in Lancashire Dynamos, to 5 $\frac{1}{8}$. Murex at 83s. 9d. have shed half-a-sovereign. Electricity supply shares have demonstrated their indifference to the general weakness by registering a few sixpenny rises. Tillings have risen 3s. to 94s. 6d. since the meeting.

English Electric Accounts

English Electric £1 ordinary have fallen from 56s. to 49s. 6d. ex dividend since the declaration of the final dividend, which again made a total of 10 per cent for the year. The fall adjusts the yield basis of the shares from just over 3½ per cent to a round 4 per cent and is attributed to market conditions, rather than to disappointment with the results. The latter were up to expectations, allowing for the loss of £125,000 due to the fuel crisis. Signs of large expansion are evident everywhere in the balance sheet, which shows greatly increased figures for stocks, work, debtors and bank loans, as well as for capital assets.

Four Per Cent Yields

The rise to 4 per cent in the yield on English Electrics, noted above, is a common symptom, among first-class industrials, of the changed complexion of the industrial markets. There is at present a prospective return of between 4 and 4¼ per cent on such leading electrical equipment equities as G.E.C. at 85s., Crompton Parkinsons at 26s., Henleys at 24s. 6d., Automatic Telephone at 62s., and Johnson & Phillips at 70s. Associated Electrical Industries are among the few shares still quoted to yield less than 4 per cent. A week or two ago, it was difficult to invest at much more than a 3½ per cent basis in industrials of this calibre.

Cable & Wireless

As some compensation for their patience, stockholders in Cable & Wireless (Holding) have been able to watch with little concern the market disturbances. The price of the ordinary, now 180, has lost only a point or two of the previous rise. Last week's maintenance of the dividend at 4 per cent for 1947 was of slight interest in comparison with the bigger issues involved in the coming arbitration over compensation. It is interesting, nevertheless, to see that the bulk of the dividend payment has been found from the accumulated surpluses of subsidiaries. Interest on the compensation finally agreed upon, will date back to January of last year, when the operating business was taken over: meanwhile the Holding Company is receiving no income from the earlier main source.

Next Week's Events

Monday, 23rd February

BIRMINGHAM.—James Watt Memorial Institute, Great Charles Street, 7 p.m. I.E.E. South Midland Radio Group. Film night.

Grand Hotel, 7 p.m. Electrical Power Engineers' Association (Midland Technical Group). "N.P.L. Testing of Apparatus for approval in accordance with the Meters Act, 1936," by A. Felton.

BOURNEMOUTH.—Gervis Hall Restaurant, 8.15 p.m. Association of Supervising Electrical Engineers (Bournemouth Branch). "History of Fluorescent Materials," by H. W. Windebank.

LONDON.—Savoy Place, W.C.2, 5.30 p.m. Institution of Electrical Engineers. Informal meeting. Discussion on "Corrosion in Electrical Apparatus," opened by J. W. Leach.

NEWCASTLE-ON-TYNE.—Neville Hall, Westgate Road, 6.15 p.m. I.E.E. North-Eastern Centre. "The Application of Electricity to Horticulture," by C. A. Cameron Brown and E. W. Golding.

Tuesday, 24th February

GLASGOW.—Royal Technical College, George Street, 6.30 p.m. I.E.E. Scottish Centre. Report on "The Practical Training of Professional Electrical Engineers," to be presented by F. R. Livock.

At the Institution of Engineers and Shipbuilders in Scotland, Elmbank Crescent, 7.30 p.m. Institution of Heating and Ventilating Engineers (Scottish Branch). "Special Fan Applications," by R. H. Holbeche.

HARROW.—St. Hilda's Hall, Northolt Road, 7.45 p.m. Association of Supervising Electrical Engineers (North West London Branch). "Electricity Supply and the Consumer," by W. J. Jervis.

LEEDS.—Corporation Electricity Department, Whitehall Road, 6.30 p.m. I.E.E. North Midland Installations Group. Discussion on "The Draft Code of Practice (Series 3.6)—Electrical Installations (General)—in relation to the Eleventh Edition of the Wiring Regulations."

LONDON.—Savoy Place, W.C.2, 7 p.m. I.E.E. London Students' Section. Address by the president, Mr. P. Good.

Lighting Service Bureau, 2, Savoy Hill, W.C.2, 6 p.m. Illuminating Engineering Society. Subject: "That Artificial Lighting is an Adequate Substitute for Natural Lighting."

LOUGHBOROUGH.—The College, 6.30 p.m. I.E.E. East Midland Centre. Junior members' night.

LUTON.—Technical College, Park Square, 7.30 p.m. Luton Electrical Society. "Wiring," by L. R. Perkins and E. J. Sutton.

Wednesday, 25th February

BIRMINGHAM.—Chamber of Commerce, 7.15 p.m. Association of Supervising Electrical Engineers. "The Electricity Act, 1947," by H. Nimmo.

BRISTOL.—Merchant Venturers' Technical College, 6 p.m. I.E.E. Western Installations Group. Discussion on "Private Generation in Industry."

LONDON.—Connaught Rooms, Great Queen Street, W.C.2, 12.30 for 1 p.m. Institute of Welding. Luncheon.

MANCHESTER.—Engineers' Club, Albert Square, 6.30 p.m. I.E.E. North-Western Radio Group. Informal lecture on "Some War-time Developments in Electronic Circuit Technique," by Prof. F. C. Williams.

SOUTHAMPTON.—University College, 6.30 p.m. I.E.E. Southern Centre. "Standardization of Power Cables," by W. H. L. Lythgoe.

Thursday, 26th February

EXETER.—Royal Clarence Hotel, 2.45 p.m. I.E.E. South-Western Sub-Centre. "Commercial Development of Electricity Supply as a Consumer Service," by C. T. Melling.

MANCHESTER.—Engineers' Club, Albert Square, 6.45 p.m. I.E.E. North-Western Students' Section. "The Electrical Equipment of Industrial Power Stations," by N. Foulsham.

Friday, 27th February

BIRMINGHAM.—Imperial Hotel, Temple Street, 6 p.m. Illuminating Engineering Society (Birmingham Centre). Annual meeting and presidential address by Dr. J. W. T. Walsh.

LONDON.—Central Hall, Westminster, 6.30 p.m. Institution of Electrical Engineers. Faraday Lecture on "Electricity and Everyman," by Dr. P. Dunsheath.

Storey's Gate, St. James's Park, S.W.1, 5.30 p.m. Institution of Mechanical Engineers. Informal meeting. Discussion on "The Future of Fuel and Power," to be opened by Dr. F. Rogers.

39, Victoria Street, S.W.1, 6.30 p.m. Junior Institution of Engineers. Informal meeting. "Automatic Washing Control in the Laundry Industry," by A. J. Simpson.

MANCHESTER.—Engineers' Club, Albert Square, 7.30 p.m. I.E.E. North-Western Students' Section. Dance.

Electricity Loans

DURING the last nine months the Electricity Commissioners sanctioned the borrowing of £88,105,869. This compares with £43,978,594 for the whole of 1946-47, £37,652,375 for 1945-46 and £28,337,818 for 1944-45. The largest item was £41,322,438 for generating plant (£19,239,336 in 1946-47), with an additional £28,076,645 (£6,799,906) for buildings. Mains and services was the next most important item, £9,426,633 (£8,299,475), while a further £5,753,109 (£4,854,982) was sanctioned in respect of distribution plant.

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1s. each) may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2.

1943

L. C. VALLIS.—" Transformers and motors for alternating current circuits." 11601. 16th July, 1943. (597507.)

1944

Marconi's Wireless Telegraph Co., Ltd.—" Electron discharge devices and circuits." 3228. 11th November, 1942. (597509.)

Westinghouse Electric International Co.—" Self-regulating motor-generator sets." 4917. 16th May, 1941. (597631.)

General Electric Co., Ltd., and E. S. Friedlander.—" Electric generators of the induction type." 5996. 31st March, 1944. (597633.)

Standard Telephones & Cables, Ltd. (International Standard Electric Corporation).—" Telephone systems." 8783. 9th May, 1944. (597688.)

Western Electric Co., Inc.—" Oscillators of the velocity modulation type." 11839. 23rd June, 1943. (597511.)

Teletype Corporation.—" Printing telegraph apparatus." 14575. 29th July, 1943. (597637.)

W. E. Bradley, F. A. Driver and E. L. Tinley.—" Indicating or control devices for steam generators." 16050. 23rd August, 1944. (597639.)

Philips Lamps, Ltd.—" Phase inversion circuits." 17183. 16th September, 1943. (597575.)

British Thomson-Houston Co., Ltd.—" Bases for electric discharge devices such as electric discharge lamps." 19813. 14th October, 1943. (597577.)

1945

Scophony, Ltd., G. Wikkenhauser and F. Okoliscanyi.—" Projection of television pictures." 1341. 16th January, 1945. (Cognate application 1342/45.) (597580.)

W. S. Tandler and D. S. Walker.—" Facsimile telegraph system." 6107. 12th March, 1945. (597581.)

Standard Telephones & Cables, Ltd., P. K. Chatterjea and L. W. Houghton.—" Synchronizing arrangements for electric television and facsimile systems." 6799. 17th March, 1945. (597647.)

Standard Telephones & Cables, Ltd.—" Metal contact rectifier casings." 8551. 22nd May, 1944. (597649.) " Electrical measuring and indicating device." 9286. 20th April, 1944. (597584.) " Television transmitting systems." 21268. 25th August, 1944. (597461.) " Electric signal transmission systems." 21661. 18th June, 1943. (597671.)

Soc. Française Radio-Electrique.—" Valve equipment for the thermal treatment of metals by high frequency electromagnetic induction." 10570. 1st December, 1942. (597524.)

Scophony, Ltd., and G. Wikkenhauser.—" Television receiving devices." 12891. 23rd May, 1945. (597525.)

Westinghouse Brake & Signal Co., Ltd.—" Electrically operated remote control systems." 13307. 2nd September, 1944. (597526.)

Sangamo Weston, Ltd.—" Photo-electric cells." 14419. 26th August, 1944. (597586.)

Plessey Co., Ltd.—" Electric interrupters or vibrators." 14657. 10th June, 1944. (597587.) " Vibratory electromagnetic interrupters." 21252. 18th August, 1944. (597459.)

A. H. Stevens (Electronic Laboratories, Inc.).—" Electric converting systems." 16260. 26th June, 1945. (597659.)

L. R. Hulls and E. R. Wigan.—" Electronic integrating apparatus." 16562. 28th June, 1945. (597531.)

W. W. Triggs (Farnsworth Television & Radio Corporation).—" Pulse keying circuit." 16985. 3rd July, 1945. (597660.)

J. B. Pierce Foundation.—" Outlet box unit for electric wiring systems." 17462. 27th October, 1944. (697661.) " Feed units for seriatim electrical conduit systems." 21609. 29th November, 1944. (597606.)

H. G. Lubszynski.—" Electron discharge devices such as television transmitting tubes." 17798. 12th July, 1945. (597532.)

British Thomson-Houston Co., Ltd.—"Ultra-high-frequency coupling devices and systems." 17879. 17th July, 1944. (597662.)

A. Benn and H. G. Allen.—" Method of joining thermoplastic materials by electromagnetic induction." 19714. 31st July, 1945. (597666.)

Coley Electrical Instruments, Ltd., and F. L. Hollister.—" Electric current switches with magnetically controlled contacts." 20704. 13th August, 1945. (597535.)

English Electric Co., Ltd., and R. D. Ball.—" Windings and cores of a.c. electric machines." 21125. 18th August, 1945. (597448.)

Soc. d'Applications et de Fabrications Industrielles Safi.—" Self-excited alternator." 21231. 6th June, 1941. (597456.)

General Motors Corporation.—" Electromotive traction system." 21296. 28th August, 1944. (597466.)

Philips Lamps, Ltd.—" Cathode-ray tubes having an electrostatic projection lens and circuit arrangements comprising such a tube." 21304. 9th March, 1940. (597468.) " Cathode-ray tubes." 21305. 9th March, 1940. (597469.)

" Mounting of indirectly heated cathodes for electron discharge tubes." 21307. 5th June, 1940. (597470.) " Electric discharge tubes." 21460. 15th June, 1940. (597503.) " Gas-filled electric discharge tubes." 21461. 15th June, 1940. (597538.) " Block-layer rectifiers." 21462 and 21465. 12th and 15th June respectively, 1940. (597539/40.)

Precision Developments Co., Ltd., and G. Olah.—" Synchronous remote control apparatus." 21319. 21st August, 1945. (597471.)

Pirelli-General Cable Works, Ltd., B. O. Ashford and R. E. Horley.—" Electric cables." 21324. 21st August, 1945. (597473.)

Maschinenfabrik Oerlikon.—" Power plant." 21338. 27th October, 1944. (597475.)

H. A. Routledge.—" Electric conduit looping-in boxes." 21339. 21st August, 1945. (597476.)

H. E. Page.—" Dish-washing machine." 21374. 12th August, 1944. (597487.)

G. S. Walliker.—" Switches for fluorescent, and luminous gas electric discharge tubes." 21379. 21st August, 1945. (597489.)

J. R. Cornelius.—" Electronic comparator for effecting fine measurements, and other comparisons." 21413. 22nd August, 1945. (Addition to 577538.) (597705.)

Siemens Bros. & Co., Ltd., and R. J. Hamblen.—" Electric contact arrangements." 21425. 22nd August, 1945. (597496.)

H. Butler, Ltd., and H. Butler.—" Moving-iron electrical measuring instruments." 21447. 22nd August, 1945. (597499.)

Baldwin Instrument Co., Ltd., and S. J. Wright.—" Electrical impulse generators." 21449. 22nd August, 1945. (597500.)

E. Mallett.—" Circuits for electrified wire fences." 21489. 2nd August, 1945. (597548.)

La Mont Steam Generator, Ltd., and G. A. Plummer.—" Water-tube boilers." 21506. 22nd August, 1945. (597552.) " Circulating pumps for forced circulation boilers." 21507. 22nd August, 1945. (597553.)

Westinghouse Electric International Co.—" Electrical devices sensitive to mechanical strain." 21598. 25th August, 1944. (597601.)

Standard Telephones & Cables, Ltd., and E. C. Lee.—" Terminations for electric cables." 21611. 23rd August, 1945. (597607.)

Metropolitan-Vickers Electrical Co., Ltd., and G. R. Higgs.—" Mobile power plants." 21620. 23rd August, 1945. (597610.)

British Insulated Callender's Cables, Ltd., Automatic Telephone & Electric Co., Ltd., P. N. Roseby, P. R. Dunn and J. Holland.—" Operation of overhead fittings in electric traction systems." 21656. 23rd August, 1945. (597614.)

A. C. Cossor, Ltd., and A. Levin.—" Electrical equipment." 21757. 24th August, 1945. (597725.)

Peto Scott Electrical Instruments, Ltd., and C. Whipman.—" Driving devices for transferring loads from one spindle to another." 21778. 24th August, 1945. (597731.)

E. G. L. Roberts.—" Manufacture of electric insulated wires, and cables." 21782. 24th August, 1945. (597734.)

R. A. Stephen.—" X-ray tubes." 23060. 7th September, 1945. (597741.)

British Thomson-Houston Co., Ltd., and L. Rushforth.—" Indirectly heated thermionic cathodes." 24788. 25th September, 1945. (597681.)

1946

F. W. Thorpe, Ltd., and F. W. Thorpe.—" Electric incandescent lamp fittings for suspended reflectors." 5423. 21st February, 1946. (597622.)

Amended Specifications

578960. General Electric Co., Ltd., and another.—" Tracking arrangements for electrical circuits of variable resonance."

585827. Standard Telephones & Cables, Ltd., and another.—" Demodulation of time-modulated electrical pulses."

British Peat Resources

Possibilities as Fuel

A REPORT entitled " The Winning, Harvesting and Utilization of Peat " has been prepared by the Fuel Research Station, Department of Scientific and Industrial Research (Stationery Office, 6d. net). It includes data derived from Eire, the Continent and North America.

Only about 2,000 tons of the 120,000 tons of pre-war output of commercial undertakings were sold as fuel in Great Britain, where reserves are estimated to amount to 1,000 million tons of air-dried peat containing 25 per cent of moisture. The heating value of peat in the bog is only about 6 per cent of an equal volume of coal, since it contains 90 to 95 per cent of water, which can be reduced by drainage to 85 to 90 per cent, but air-drying is necessary for further moisture elimination. When absolutely dry, the calorific value is 9,000 to 9,500 B.Th.U. per lb (5,000 to 5,275 cal per kg).

The weight of machine-cut air-dried peat produced per worker in Eire in 1945 amounted to 175 tons, compared with 260 to 300 tons of coal in the United Kingdom. The production cost was 24s. per ton, with average labour costs of £3 per week, plus capital charges on plant equivalent to 10s. per ton. Allowing for higher wage levels here the peat would probably be no cheaper than coal. The total cost of peat briquettes with a c.v. of 8,300 B.Th.U. (4,610 cal per kg) and containing 10 per cent moisture produced at a factory in Eire was 54s. 9d. per ton. The cost of transporting peat, allowing for the difference in calorific value, would be two and a half times that for coal.

The possibilities are discussed of treating peat as a chemical raw material in combination with its use as fuel.

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Ashford.—8th March. U.D.C. 150-MVA main switches. (6th February.)

Birkenhead.—3rd March. Electricity Department. 150-MVA switchgear and 500- and 750-kVA transformers. (13th February.)

Blackpool.—8th March. Electricity Department. One 8-panel 6·6-kV metalclad switchboard and one set of control equipment. (See this issue.)

Derbyshire.—25th February. County Council Works Department. Cables, lamps and sundry electrical accessories for the year ending 31st March, 1949. (6th February.)

Dunfermline.—1st March. Fife County Council. Electrical work, etc., for central kitchen and dining room at the High School. Schedules from C. R. Douglas & Co., 15, East Port, Dunfermline.

Edinburgh.—Electricity Department. Interlocked tile cable covers for year ending 28th May, 1949. Burgh electrical engineer, Dewar Place.

Egypt.—31st March. Egyptian Government. In connection with the invitation for the supply of mechanical and electrical equipment for the Aswan Dam hydro-electric scheme, the Government announces that offers of second-hand diesel generating sets of 250 kW each will be considered. (See this issue.)

Farnworth.—10th March. Electricity Department. Switchgear, distribution boards, cables, earthenware pipes and cable tiles. (See this issue.)

Irlam.—1st March. Urban District Council. Electric lamps for one year to 31st March, 1949. Surveyor, Council Offices.

Kettering.—1st March. Electricity Department. Transformers. (6th February.)

Littleborough.—28th February. Electricity Department. E.h.v. switchgear. (13th February.)

Plympton St. Mary.—6th March. Electricity Department. Supply, delivery and erection of approximately 18 miles of 6,600-V 0·1-sq in. overhead line. (6th February.)

Stoke-on-Trent.—10th March. Electricity Department. 33-kV and 6·6-kV switchgear. (See this issue.)

Orders Placed

Glasgow.—Corporation. Accepted. Equipment for the Braehead power station: Ash and dust handling plant (£120,196).—Babcock & Wilcox. Central evaporating plant (£7,987).—Aiton & Co. Circulating water pumps and pump house equipment (£69,532).—Drysdale & Co.

Sunderland.—Corporation. Accepted. Multicore cables (£1,460).—Mersey Cable Works. Single-core h.v. cables (£5,166).—B.I. Callenders' Cables. Additions to the Museum substation: Transformers (£2,272).—C. A. Parsons & Co. Transformer panel, current changing transformers, and medium voltage isolators (£1,135).—A. Reyrolle & Co. Fuse board (£300).—W. T. Henley's Telegraph Works Co.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Alston (Cumberland).—Alterations and additions to the Cottage Hospital; Graham & Roy, 6, Paternoster Row, Carlisle.

Amersham.—Thirteen pairs of houses and garages; Jesse Mead, Ltd., builders, 176, Berkhamsted Road, Chesham, Bucks.

Barking.—Factory premises, Creeksmouth; Patent Victoria Stone Co., Ltd., 638, Salisbury House, E.C.2.

Bath.—School, Southdown (£71,500); borough surveyor, Guildhall.

Central canteen, St. Martin's Hospital; city surveyor, Guildhall.

Extensions, Albany Works, for Andrews Technical Equipment, Ltd.; E. F. Tew & Partners, 7, Northumberland Buildings.

Bicester.—Infants' school; county architect, Becket Street, Oxford.

Bolton.—Civic restaurant, Victoria Square and Howell Croft South; borough engineer.

Cambridge.—Duplex houses (52), Newmarket Road West; borough surveyor, The Guildhall.

Chelmsford.—Office and workshops, Beehive Lane (£16,750); H. Conolly, county architect, County Hall.

Chesterfield.—Houses (210), Grassmoor, Killamarsh and Tupton; J. B. Wikeley, surveyor, Rural Council House.

Chorlton-upon-Medlock.—Rebuilding wing of Eye Hospital, Nelson Street and Oxford Road, for Board of Management; L. Brown & Son, Ltd., builders, Macclesfield Road, Wilmslow.

Croydon.—Secondary modern schools, Stroud Green (£289,440), and new operating theatre suite at Mayday Hospital (£40,000); borough engineer, Town Hall.

Dartford.—School, Wentworth Drive; Kent county architect, Maidstone.

Eastbourne.—Block of 30 flats, The Avenue; S. G. Scales, architect, National Provincial Bank Chambers, Terminus Road.

Finchley.—Primary school, Nether Street; C. G. Stillman, county architect, Middlesex House, Vauxhall Bridge Road, S.W.1.

Finsbury.—Dwellings (98), Busaco Street (£182,000); F. G. Minter, Ltd., builders, Putney High Street, S.W.15.

Forfar.—Houses (80) for Corporation; town clerk.

Golders Green.—Block of 45 flats, Connaught Drive; Geo. Reed & Sons, Ltd., builders, 25, Beaufort Park, Falloden Way, N.W.11.

Gosport.—District offices, Stokes Road; Ministry of National Insurance.

Hampstead.—Flats (102) in five- and six-storey blocks, King Henry's Road, for Borough Council; Douglas & J. D. Wood, architects, 1, Old Burlington Street, W.1.

Hatfield.—Technical college, for Herts C.C.; Easton & Robertson, architects, 54, Bedford Square, W.C.1.

Hereford.—Houses (20) and maisonettes (48), Holmer Street, for T.C.; C. E. T. Booth, architect, Kyrle Street.

Ilford.—Seven-storey block of 38 flats, Beehive Lane; L. E. J. Reynolds, borough surveyor, Town Hall.

Keighley.—Works extensions, Station Mills, Cononley, for H. Green & Co., Ltd.; E. Harrison & Son, builders, Netherghyll House, Cononley.

Keswick.—Secondary school, Lairthwaite, for Cumberland C.C.; G. N. C. Swift, clerk, The Courts, Carlisle.

Kiveton Park.—Dwellings (36), Dinnington and Harthill; E. W. Frith, clerk to R.D.C., Council Offices, Kiveton Park, near Sheffield.

Liverpool.—Twenty-one schools in Litherland, Formby and Crosby areas, for Lancashire E.C. (estimated cost, £2,617,375); G. Noel Hill, county architect, County Offices, Preston.

Luton.—County primary school, Leagrave; H. V. Lobb, architect, 20, Gower Street, W.C.1.

Manchester.—Additions to works, Hendham Vale, for Small & Parkes, Ltd.; H. S. Fairhurst & Son, architects, 55, Brown Street.

Extensions to works, Gibbon Street, for F. C. Calvert & Co., Ltd.; A. Maynard, architect, 169, Woodsmoor Lane, Davenport, Stockport.

Office and extensions to works, Elsinore Road and Ayres Road, Old Trafford; J. Collins & Co., Ltd.

Laboratories for Manchester Royal Infirmary; Thomas Worthington & Sons, architects, 178, Oxford Road.

Secondary school, Baguley Hall; city architect, Town Hall.

Additions to chemical works, Tenax Road, Trafford Park, for Geigy Co., Ltd.; B. Waterhouse, architect, 134, Deansgate, Manchester.

Mitcham.—Houses (99), Tamworth Lodge estate; R. H. White, town clerk, Town Hall.

Newcastle-on-Tyne.—Extensions to buildings for King's College; J. R. Rutherford & Sons, Jesmond.

Northenden.—Factory, Bradnor Road and Paston Road, for W. Bennett (Spare Parts), Ltd.; G. Bullimore, architect, 50, Barnfield Road, Davenport, Stockport.

Nuneaton.—School, Bulkington, for Warwickshire E.C.; Coltham & Son, Ltd., builders, Castle Street, Coventry.

Omagh.—Houses (72) on several sites, for R.D.C.; M'Carthy & Lilburn, surveyors, Scottish Provident Buildings, Belfast.

Plymouth.—Factory, Ernesettle Lane; Mace, Rainbow & Stone, Ltd., clothing manufacturers, 25, Berners Street, W.1.

Rayleigh (Essex).—Permanent houses (30) on three sites; G. Shenstone, architect to U.D.C., 34, Bloomsbury Way, London, W.C.1.

Redditch.—Infants' and nursery schools, Batchley estate; L. C. Lomas, county architect, 60, The Tything, Worcester.

Rotherham.—Research centre, Whiston Grange, Moorgate Road; Birmingham Small Arms Co., Ltd., Armory Road, Birmingham, 11.

Rugby.—Primary school, Westfield estate; C. H. Elkins, county architect, Shire Hall, Warwick.

Sellafield (Cumberland).—Works in connection with atomic energy development (£1,500,000 for first section); J. Laing & Sons, Ltd., Mill Hill, London, N.W.7.

Sheffield.—College of Technology and School of Art, Fitzwilliam Street, West Street and Eldon Street; W. G. Davies, city architect, Town Hall.

Machine shop, and extensions to works; John Cooper & Son, Ltd., tool makers, Broad Lane.

University buildings scheme; J. W. Beaumont & Sons, architects, Danlee Buildings, 53, Spring Gardens, Manchester.

Staveley.—Traditional houses (38), Ingersall Green estate, for U.D.C.; B. G. Porter, Ltd., builders, Station Road, Clown, near Chesterfield.

Tynemouth.—Houses (16), North Shields; borough engineer, 19, Howard Street, North Shields.

West Bromwich.—Extensions to works for Aluminium Products, Ltd., Haines Street; J. H. Lewis, architect, 113, Edmund Street, Birmingham.

Willenhall.—County primary school, Vaughan Road, Portbello; A. C. H. Stillman, county architect, County Education Offices, Earl Street, Stafford.

Willington.—Extensions to works of R. Hood, Haggie & Sons, Ltd., rope manufacturers.

Worthing.—Houses (44) at The Crescent, The Strand; borough architect, Town Hall.